FINAL PROGRAM

49th Annual Meeting of the Health Physics Society

(American Conference of Radiological Safety)

July 11-15, 2004
Marriott Wardman Park Hotel
Washington, DC

Headquarters Hotel:

Marriott Wardman Park Hotel

Telephone: 202-328-2000

Fax: 202-234-0015

Future Annual Meetings

50th	7/10-14, 2005	Spokane, WA
51st	6/25-29, 2006	Providence, RI
52nd	7/8-12, 2007	Portland, OR

Future Midyear Topical Meeting

38th	2/13-16, 2005	New Orleans, LA

Health Physics Society
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Registration Hours

Registration will take place at the Marriott Wardman Park Hotel:

Saturday, July 10	2:00 - 5:00 pm
Sunday, July 11	7:00 am - 7:00 pm
Monday, July 12	8:00 am - 4:00 pm
Tuesday, July 13	8:00 am - 4:00 pm
Wednesday, July 14	8:00 am - 4:00 pm
Thursday, July 15	8:00 am - Noon

Officers

KENNETH R. KASE, *President*
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Edward F. Maher, *Secretary*
Kent N. Lambert, *Treasurer*
Richard E. Toohey, *Treasurer-Elect*
John R. Frazier, *Past President*
Richard J. Burk, Jr., *Executive Secretary*

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Cheryl L. Olson, Rules Chair
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Otto G. Raabe, President's Emeritus Committee Chair
Genevieve S. Roessler, Editor-in-Chief of *HPS Newsletter*
Michael T. Ryan, Editor-in-Chief of *Health Physics*
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Kathryn Brock
Robert N. Cherry, Jr.
Michael S. Davidson
Christopher Martel
Craig D. Nusenow
Daniel J. Strom
Glenn Sturchio
Scottie Walker

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Jack Patterson, Co-Chair
Janna Shupe, Co-Chair
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Jason Dunavant
Fred Ferate
Steve Hand
Bill Holcomb
Paul Marshall
Kathy McLellan
Kristine Patterson
Melisa Ramos
Ralph Shuping
Bill Ulicny
Jamey West

SATURDAY

8:00 AM-5:00 PM — AAHP 1: MARSSIM and MARLAP: Underlying Processes. . .
AAHP 2: Reviewing the US Transportation Reg. After . . .
AAHP 3: Low Dose Risks of Ionizing Radiation

SUNDAY

7:00 AM-7:00 PM — Registration
PEPs — A-H: 8:00-10:00 am; 10:30 am-12:30 pm; 2:00-4:00 pm
6:15-7:30 PM — Welcome Reception, Sponsored by Landauer, Inc. (Salon 1)
7:40-8:30 PM — Capitol Steps, Sponsored by Landauer, Inc. (Salon 1)

MONDAY

7:00-8:00 AM — CEL 1: Terrorism: One Pediatrician's Perspective (Maryland)
8:00 AM-4:00 PM — Registration

8:15-9:45 AM — *Plenary Session: Radiation Protection . . .* (Salons 2/ 3)

Sessions

	Salon 3	Delaware	Maryland
10 AM-Noon	MAM-A: Operational HP 1 (Training)	MAM-B: Internal Dosimetry and Bioassay	MAM-C: Regulatory/ Legal Issues

Events

Noon-1:30 PM — Exhibits Open with Complimentary Lunch
12:15-2:15 PM — PEP Sessions
1:30-3:00 PM — Poster Session

Sessions

	Salon 3	Delaware	Maryland
3-5:30 PM	MPM-A: Oper. HP 2 5:30 pm - RSO Section Business Meeting	MPM-B: Decommissioning	MPM-C: Communication with the Media - A Panel Discussion

TUESDAY

7:15-8:15 AM — CEL 3: Physics, Health Physics, and Applications. . . (Maryland)
8:00 AM-4:00 PM — Registration
9:30 AM-4:15 PM — Exhibits Open

Sessions

	Salon 3	Delaware	Maryland
8:30 AM-Noon	TAM-A: AAHP Session: The Role of Radiation . . . Part 1	TAM-B: Multi-Agency Radiological Laboratory Analytical Protocols	TAM-C: Decomm. Sect. Special Session 11:15 am - Decomm. Section Bus Mtg

Events

Noon-1:30PM — AAHP Luncheon (Wilson A/B)
12:15-2:15PM — PEP Sessions

Sessions

	Salon 3	Delaware	Maryland
2:30-5:30 PM	TPM-A: AAHP Session: The Role of Radiation . . ., Part 2 5:00 pm - AAHP Open Mtg	TPM-B: Government Section Special Session: Lasers 4:45 pm - Government Section Business Mtg	TPM-C: Medical Section Special Session 4:45 pm - Medical Section Bus Mtg

6:00-7:00 PM — Reception in Exhibit Hall
7:00-10:00 PM — Awards Dinner (Salons 2/3)

SATURDAY

8:00 AM-5:00 PM	AAHP 1: MARSSIM & MARLAP: Underlying Processes. . . AAHP 2: Reviewing the US Transportation Reg. After. . . AAHP 3: Low Dose Risks of Ionizing Radiation

SUNDAY

7:00 AM-7:00 PM	Registration
PEPs	A-H: 8:00-10:00 am; 10:30 am-12:30 pm; 2:00-4:00 pm
6:15-7:30 PM	Welcome Reception, Sponsored by Landauer, Inc. (Salon 1)

MONDAY

7:00-8:00 AM	CEL 2: Radiation Protection ANSI Standards and . . . (Virginia)
8:00 AM-4:00 PM	Registration
8:15-9:45 AM	*Plenary Session: Radiation Protection* . . .(Salons 2/ 3)

Sessions

	Virginia	Washington 4	Washington 1
10AM-Noon	MAM-D: Intersociety Workshop-Sharing Resources (sponsored by the Liaison Comm.)	ABHP Exam *(8:00 - 11:00 am)*	MAM-E: External Dosimetry

Events

Noon-1:30 PM	Exhibits Open with Complimentary Lunch
12:15-2:15 PM	PEP Sessions
1:30-3:00 PM	Poster Session

Sessions

	Virginia	Washington 4	Washington 1
3-5:30 PM	MPM-D: Emergency Planning/Response	ABHP Exam *(12:30 - 6:30 pm)*	MPM-E: Workshop: To Make the U.S. Transuranium and Uranium . . .

TUESDAY

7:15-8:15 AM	CEL 4: High Dose Irradiation of Mail and Products (Virginia)
8:00 AM-4:00 PM	Registration
9:30 AM-4:15 PM	Exhibits Open

Sessions

Virginia	Washington 4	Washington 1
TAM-D: Uses of Dosimetry for Epidemiology Studies...	TAM-E: Accelerator Section Special Session 11:45 am - Accelerator Section Business Mtg	TAM-F: ANSI/HPS N13 Session

Events

Noon-1:30PM	AAHP Luncheon (Wilson A/B)
12:15-2:15PM	PEP Sessions

Sessions

TPM-D: Special Session: New Dosimetry and Risk Estimates for Atomic Bomb Survivors	TPM-E: Accelerator Section Special Session

6:00-7:00 PM	Reception in Exhibit Hall
7:00-10:00 PM	Awards Dinner (Salons 2 & 3)

WEDNESDAY

Events

7:00-8:00 AM	CEL 5: Outpatient Release of Nuclear Medicine . . . (Maryland)
8:00 AM-4:00 PM	Registration
9:30 AM-Noon	Exhibits Open
8:00-11:30 AM	*Plenary Session: Science Policy and Politics* (Salon 3)
12:15-2:15 PM	PEP Sessions

Sessions

2:30-5:30 PM

Salon 3	Delaware	Maryland
WPM-A: Workshop: Radiation Safety Without Borders: Where Have We Been and Where are We Going? (3:00-5:00 pm)	WPM-B: Instrumentation	WPM-C1: Special Session with the Society of Nuclear Medicine WPM-C2: Time Machine: A Radium Producer's Photo Album (5:00-5:30 pm)

5:30 PM	HPS Business Meeting (Maryland)
6:00-8:00 PM	Adjunct Session: Aerosol Measurements (Delaware)

THURSDAY

7:15-8:15 AM	CEL 7: Radioactive Cure-alls (Maryland)
8:00 AM-Noon	Registration

Sessions

8:30 AM-Noon

Cotillion	Delaware	Maryland
THAM-A1: Risk Analysis THAM-A2: Dose Reconstruction and History (10:00-11:30 am)	THAM-B: Special Session: Low Dose Radiation Research	THAM-C: Military Health Physics

MAM = Monday AM Session
MPM = Monday PM Session
TAM = Tuesday AM Session
TPM = Tuesday PM Session
WAM = Wednesday AM Session
WPM = Wednesday PM Session

WEDNESDAY

Events

7:00-8:00 AM	CEL 6: Radiation Health Effects in Atomic . . . (Virginia)
8:00 AM-4:00 PM	Registration
9:30 AM-Noon	Exhibits Open
8:00-11:30 AM	*Plenary Session: Science Policy and Politics* (Salon 3)
12:15-2:15 PM	PEP Sessions

Sessions

2:30-5:30 PM

Virginia	Washington 4
WPM-D: Government Section Special Session: Homeland Security	WPM-E1: Waste Management WPM-E2: Non Ionizing Radiation (4:45-5:30 pm)

5:30 PM	HPS Business Meeting (Maryland)
6:00-8:00 PM	Adjunct Session: Aerosol Measurements (Delaware)

THURSDAY

7:15-8:15 AM	CEL 8: Current Issues in Radiation Epidemiology. . .(Virginia)
8:00 AM-Noon	Registration

Sessions

8:30 AM-Noon

Virginia	Washington 4
THAM-D: Environmental	THAM-E1: Medical Health Physics THAM-E2: Radon (10:45 am-Noon)

NOTE FOR CHPS

The American Academy of Health Physics has approved the following meeting-related activites for Continuting Education Credits for CHPs:

- Meeting attendance is granted 2 CECs per half day of attendance, up to 12 CECs
- AAHP 8 hour courses are granted 16 CECs each;
- HPS 2 hour PEP courses are granted 4 CECs each;
- HPS 1 hour CELs are granted 2 CECs each.

Important Events!

Welcome Reception

The Welcome Reception, sponsored by Landauer, Inc., will be held Sunday, July 11 from 6:15–7:30 pm at the Marriott Wardman Hotel, Ballroom Salon 1

Exhibits

Free Lunch! Free Lunch! – Noon, Monday, July 12. All registered attendees are invited to attend a complimentary lunch in the exhibit hall.

Breaks Monday Afternoon-Wednesday Afternoon – Featuring morning Continental Breakfasts and afternoon refreshments such as ice cream and cookies. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!

Sessions

All Courses and Sessions will be held at the Marriott Wardman Park Hotel.

AAHP Awards Luncheon

Tuesday July 13
Noon-1:30 pm
Wilson A/B

HPS Awards Banquet

Tuesday Evening Reception in Exhibit Hall
6:00-7:00 pm
Tuesday Evening Awards Banquet
7:00-10:00 pm
Ballroom Salons 2/3

Different this Year!

Capitol Steps Presentation (political satire), sponsored by Landauer, Inc., immediately following the
Welcome Reception, 7:40-8:30 pm, Sunday July 11, Ballroom Salon 3

Reception in the Exhibit Hall prior to the Awards Dinner,
Tuesday July 13, 6:00-7:00 pm.

Things to Remember!

All sessions have **computer projection** as the preferred format for presentation.
No slide presentations this year.

All posters up Monday–Wednesday in Exhibit Hall

Poster Session featured Monday, 1:30-3:00 pm
No other sessions at that time

Tuesday Evening Awards Reception & Banquet

Join your peers in honoring the following awardees while enjoying a delicious meal. Brief award presentations will immediately follow the dinner. All attendees are strongly encouraged to stay and show support for the award recipients. This event will take place in the **Marriott Wardman Park Hotel on Tuesday, July 13 from 7:00 - 10:00 pm, in the Ballroom Salons 2/3**. The following awards are to be presented:

Robley D. Evans Commemorative Medal
Geoffrey G. Eichholz

Distinguished Scientific Achievement Award
Ralph Thomas
F. Ward Whicker

Elda E. Anderson Award
Timothy A. DeVol

Founders Award
Kenneth L. Miller

Outstanding Science Teacher Award
John R. Schaefers

Fellow Award

Edgar D. Bailey
R. Thomas Bell
Donald E. Bihl
Leroy F. Booth
Norman Cohen
Frederick Cummings
Nancy M. Daugherty
Clayton S. French
John P. Hageman
Mark D. Hoover
Ninni Jacob
John P. Jacobus
John D. Kinneman
Joel O. Lubeneau
Ruth E. McBurney
Bruce A. Napier
Lester A. Slaback, Jr.
Gary H. Zeman

The following menu has been selected for the **Awards Banquet:**

Selection of Breads and Rolls

Wardman Salad
Mixed Greens, Fresh Raspberries, Goat Cheese and Walnuts with Balsamic Vinaigrette

Honey Roasted Moroccan Chicken
Served with Mint & Cumin

Orzo Pilaf with Diced Red Peppers

Mediterranean Style Ratatouille and Spinach

Chocolate Pyramid with Creme Brulee
Mango Sorbet and Raspberry Sauce

Freshly Brewed Coffee, Decaffeinated Coffee and Hot Tea

G. William Morgan Trust Fund

When G. William Morgan died in 1984, he bequeathed a substantial fund to the Health Physics Society. The will requires that the fund's interest be used to have internationally known experts present papers at the Society's meetings. Michael C. O'Riordan of the United Kingdom's National Radiation Protection Board was the first international expert to be supported by the Society through the Morgan Fund. O'Riordan's presentation "Radon in Albion" was part of the Indoor Radon Session at the 1989 Albuquerque meeting.

G. William Morgan was a Charter member of the Society and during the Society's early years a very active member. Bill began his health physics career at Oak Ridge National Laboratory as part of the Manhattan Project. He later joined the Atomic Energy Commission and was instrumental in the development of the initial regulations that became part of 10 CFR Part 20. He was a great champion of education and helped establish the AEC Health Physics Fellowship Program. Bill later became very successful in the real estate business, but always retained his interest in the health physics profession. The Society's Presidents Emeritus Committee has responsibility for the selection of the international experts who will be supported by the G. William Morgan Trust Fund.

Registration Hours

Marriott Wardman Park Hotel

Saturday, July 10 ..... 2:00 - 5:00 pm
Sunday, July 11 ..... 7:00 am - 7:00 pm
Monday, July 12 ..... 8:00 am - 4:00 pm
Tuesday, July 13 ..... 8:00 am - 4:00 pm
Wednesday, July 14 ..... 8:00 am - 4:00 pm
Thursday, July 15 ..... 8:00 am - Noon

Registration Fees:

Class	Pre-Reg	On-Site
♦HPS Member	$330	$405
♦Non-Member**	$400	$475
❖Student	$ 60	$ 60
●Companion	$ 55	$ 55
Exhibition ONLY	$ 25	$ 25
Exhibitor (2/booth)	No Fee	No Fee
Add'l Awards Lunch	$ 60	$ 60
AAHP Awards New CHP	Free	Free
AAHP Awards (CHP)	$ 10	$ 10
AHHP Awards Guest	$ 15	$ 15
■Member, 1 Day	$225	$225
■Non-Member 1 Day	$225	$225
■Student, 1 Day	n/a	$ 30

♦ Includes Sunday Reception, Monday Lunch and Tuesday Awards Dinner

❖ Includes Sunday and Student Receptions, Monday Lunch and Tuesday Awards Dinner

● Includes Sunday Reception, Sunday-Wednesday Continental Breakfast and afternoon snacks

■ Includes Sessions and Exhibition ONLY

** Includes Associate Membership for year 2004.

LAC Room

Saturday - Thursday 8228

Information

Speaker Instructions

You will be allotted a total of 12 minutes unless you have been notified otherwise.

The **Ready Room** (8222) will be open Sunday from 2-5 pm, Monday through Wednesday from 8-11 am and 2-5 pm, and Thursday from 8-9 am. You must check in at the Ready Room no later than the following times:

Present. Time	Delivery Deadline
Monday am	2-5 pm Sunday
Monday pm	8-11 am Monday
Tuesday am	2-5 pm Monday
Tuesday pm	8-11 am Tuesday
Wednesday am	2-5 pm Tuesday
Wednesday pm	8-11 am Wednesday
Thursday am	2-5 pm Wednesday

Please meet with your session chairs in the meeting room where your paper will be presented 10 minutes before the beginning of the Session.

Placement Service

Placement Service listings will be posted in Room 8229, with hours from 8:00 am-5:00 pm, Monday through Wednesday and Thursday from 8:00 am-Noon. Interviews may be conducted in the designated areas of the Placement Room.

Business Meeting

The **HPS Annual Business Meeting** will be convened at 5:30 pm on Wednesday, July 14, in the Maryland Room.

Badge Color Code

White=HPS Member, Nonmember, Student
Blue=Companion
Green=Exhibition Only
Salmon=Exhibitor

The Companion/Hospitality Room

The Hospitality Room is in the Embassy Room at the Marriott Wardman Park Hotel. Come meet with friends and relax and learn about the available attractions in Washington. Local HPS members will be on hand to help with planning day trips, restaurant recommendations, and navigating DC's Metro. On Monday morning from 8 to 9 am, we invite all registered companions to an official welcome. We will provide an orientation to Washington and answer any questions you might have.

Continental breakfast will be available Monday through Wednesday mornings for registered companions, as will afternoon refreshments if attendance warrants.

Hospitality Room
for Registered Companions

Monday Welcome
8:00 - 9:00 am
Balcony C/D

Hours/Days

Embassy Room

Sunday ..... 9 am-3 pm
Monday ..... 9 am-3 pm
Tuesday ..... 8 am-3 pm
Wednesday ..... 8 am-3 pm

Activities and Tours

Note: Tickets still available for sale can be purchased at the HPS Registration Desk

Sunday, July 11

DC City Tour	9 am-Noon
Welcome Reception	6:15-7:30 pm
Capitol Steps Presentation	7:30-8:30 pm
DC City Tour by Night	9 pm-Midnight

Monday, July 12

DC City Tour	9 am-Noon
Smithsonian Udvar Hazy	12:30-5:30 pm
NIH	2 -5:30 pm
DC City Tour by Night	9 pm-Midnight

Tuesday, July 13

5k Walk/Fun Run	6:30 am
NASA	9:30 am-3:30 pm
Camden Yards	9:30 am-5:30 pm
Washington Hospital Ctr	12:30-4 pm
Recep Exhibit Hall	6-7 pm
Awards Banquet	7-10 pm

Wednesday, July 14

NIST	9:30 am-1 pm
Mt Vernon Tour	9:45 am-5 pm
"The Producers"	6:30-11 pm
Pub Crawl	7-10 pm

Childcare

Arrangements for child care are the responsibility of the guest. Rates are dependent upon the childcare situation. The Marriott Wardman Park does not endorse or assume responsibility for any childcare arrangements. Contact the hotel's Concierge if you have questions regarding childcare.

Health Physics Society Committee Meetings

Friday, July 9, 2004

ABHP BOARD MEETING
9:00 am - 5:00 pm *Coolidge Room*

Saturday, July 10, 2004

FINANCE COMMITTEE
8:00 am - Noon *Room 8206*

ABHP BOARD MEETING
9:00 am - Noon *Coolidge Room*

AAHP EXECUTIVE COMMITTEE
1:00 - 5:00 pm *Coolidge Room*

CONTINUING EDUCATION COMMITTEE
1:00 - 5:00 pm *Room 8212*

HPS JOURNAL MEETING
1:00 - 6:00 pm *Harding Room*

Sunday, July 11, 2004

HPS BOARD OF DIRECTORS
8:00 am - 5:00 pm *Delaware A*

VENUES COMMITTEE
8:30 am - 4:30 pm *Room 8209*

AAHP EXECUTIVE COMMITTEE
9:00 am - Noon *Virginia C*

ANSI N42.37 COMMITTEE
9:00 am - Noon *Room 8216*

PROGRAM COMMITTEE
12:30 - 2:00 pm *Room 8222*

HPS STUDENT BRANCHES
2:00 - 4:00 pm *Room 8216*

Monday, July 12, 2004

ANSI N13 COMMITTEE FOR DOSE LIMITS
8:30 - 11:30 am *Room 8212*

RULES COMMITTEE
10:00 am - Noon *Thurgood Marshall Rm*

MEMBERSHIP COMMITTEE
Noon - 2:00 pm *Room 8218*

PUBLICATIONS COMMITTEE
Noon - 2:00 pm *Room 8209*

RSO SECTION EXECUTIVE BOARD
12:15 - 1:15 pm *Room 8217*

SYMPOSIA COMMITTEE
12:30 - 2:00 pm *Room 8210*

AAHP CONTINUING EDUCATION COMMITTEE
1:00 - 2:00 pm *Room 8201*

CHAPTER COUNCIL MEETING
1:00 - 2:00 pm *Maryland Room*

ANSI N42.317
1:00 - 5:00 pm *Thurgood Marshall Rm*

AAHP NOMINATING COMMITTEE
2:00 - 3:00 pm *Room 8205*

AEC ACCREDITATION SUBCOMMITTEE
2:00 - 4:00 pm *Room 8216*

HPS/ANSI N13.22 WRITING GROUP
2:00 - 5:00 pm *Room 8226*

WEB SITE ASK THE EXPERTS EDITORS
2:00 - 5:00 pm *Room 8212*

HISTORY COMMITTEE
3:00 - 5:00 pm *Room 8217*

STRATEGIC PLANNING COMMITTEE
3:00 - 5:00 pm *Room 8210*

ACCELERATOR SECTION BOARD MEETING
5:00 - 6:30 pm *Room 8218*

AAHP PROFESSIONAL DEVELOPMENT COMMITTEE
5:30 - 6:30 pm *Room 8205*

HDER CHAPTER TRAINING DINNER
6:00 - 9:00 pm *Coolidge Room*

Tuesday, July 13, 2004

COMMITTEE CHAIR BREAKFAST
7:30 - 9:00 am *Balcony A*

ANSI N43.3 WORKING GROUP
8:00 am - Noon *Room 8223*

ANSI N13.48 WORKING GROUP
8:30 - 11:00 am *Room 8217*

ANSI N42.18 COMMITTEE/WORKING GROUP
9:00 am - 4:00 pm *Thurgood Marshall Rm*

AWARDS COMMITTEE
11:30 am - Noon *Room 8212*

SCIENTIFIC & PUBLIC ISSUES COMMITTEE
Noon - 1:00 pm *Room 8212*

NOMINATING COMMITTEE
Noon - 2:00 pm *Room 8223*

SCIENCE TEACHERS WORKSHOP COMMITTEE
Noon - 2:00 pm *Room 8216*

HP PROGRAM DIRECTORS ORGANIZATION
Noon - 2:00 pm *Room 8226*

LEGISLATION AND REGULATION COMMITTEE
1:00 - 3:00 pm *Room 8209*

AIR SAMPLING STANDARD N13.56
2:00 - 4:00 pm *Room 8212*

LIAISON COMMITTEE
2:00 - 4:00 pm *Room 8217*

PUBLIC EDUCATION COMMITTEE
2:30 - 4:30 pm *Room 8216*

HOMELAND SECURITY COMMITTEE
3:00 - 5:00 pm *Room 8226*

Wednesday, July 14, 2004

AFFILIATES COMMITTEE
7:30 - 9:30 am *Balcony D*

RADIOLOGICAL CONTROL COORDINATING COMMITTEE
8:00 am - 5:00 pm *Room 8212*

INTERNATIONAL RELATIONS COMMITTEE
9:00 am - Noon *Room 8216*

LABORATORY ACCREDITATION POLICY COMMITTEE
10:00 am - Noon *Room 8209*

LAB. ACCREDITATION ASSESSMENT COMMITTEE
Noon - 2:00 pm *Room 8209*

SUMMER SCHOOL COMMITTEE
Noon - 2:00 pm *Eisenhower Room*

AD HOC COMMITTEE ON RESTRUCTURING
Noon - 2:00 pm *Room 8226*

OSHA ALLIANCE
1:00 - 3:00 pm *Room 8216*

ACADEMIC EDUCATION COMMITTEE
2:00 - 4:00 pm *Room 8219*

ANSI N43-17 X AND GAMMA SECURITY SYSTEMS HARMONIZATION
2:30 - 5:30 pm *Room 8226*

HOMELAND SECURITY COMMITTEE
3:00 - 5:00 pm *Eisenhower Room*

Thursday, July 15, 2004

STANDARDS, HPSSC/N13/N43
8:00 am - Noon *Room 8212*

ANSI HPS N13.32 WORKING GROUP
9:00 am - Noon *Room 8224*

PROGRAM COMMITTEE
Noon - 3:00 pm *Room 8209*

HPS BOARD OF DIRECTORS
1:00 - 5:00 pm *Hoover Room*

Monday

7:00 - 8:00 AM **Room: Maryland**
CEL-1 Terrorism: One Pediatrician's Perspective. *R. Brent; Alfred I. duPont Hospital*

7:00 - 8:00 AM **Room: Virginia**
CEL-2 Radiation Protection ANSI Standards and the Health Physics Society. *J. Ring; Harvard University*

8:15 - 9:45 am **Salons 2/3**

PL1: Plenary Session 1 Radiation Protection Recommendations and Public Policy

Chair: Kenneth Kase

8:15 AM
Welcome to Washington. *Kenneth Kase; President, Health Physics Society; and a Local Arrangements Committee Representative*

8:30 AM **PL1.1**
Are the Proposed Recommendations of the International Commission on Radiological Protection (ICRP) Taking Us in the Right Direction? *R.V. Osborne; Ranasara Consultants Inc.* ***(Robert S. Landauer, Sr. Lecture)***

9:00 AM **PL1.2**
Incorporating Lay Views in the Radiation Protection Process. *H.K. Florig; Carnegie Mellon University* ***(G. William Morgan Lecture)***

9:30 AM **Discussion**

10:00 -11:45 am **Salon 3**

MAM-A: Operational Health Physics 1 (Training)

Chair: Ben Edwards

10:00 AM **MAM-A.1**
Comparison of Dose Rate Evaluation Methodologies Using Radiation Transport Software. *R.J. McConn, J.C. McDonald; Pacific Northwest National Laboratory*

10:15 AM **MAM-A.2**
Ask the Expert: A New Interactive HPS Web-Based Feature. *C.G. Jones, R.L. Brent, G.S. Roessler; US Nuclear Regulatory Commission, Alfred I. duPont Hospital, Editor, Health Physics Web Site*

10:30 AM **MAM-A.3**
Determining the Feasibility of Using Synchronous Collaborative Distributed Learning for Radiation Protection Training. *D.D. Sprague, J. Basore; Lawrence Livermore National Laboratory*

10:45 AM **MAM-A.4**
Radiation Safety Training from Power Point to On-line. *M.A.Ramos; Radiation Safety Academy*

11:00 AM **MAM-A.5**
Live Contamination Monitoring Exercises - A Training Tool. *S. Tilden, M. Roberson, V. Voegtli; National Institutes of Health*

11:15 AM **MAM-A.6**
An Approach to Enhance Health Physics Education in Higher Education. *P. Retka, K. Claver, R.R. Brey; Idaho State University*

MAM-A.7 **Cancelled**

Monday

11:30 AM **MAM-A.8**
A Straight-Forward Approach to Radioactive Material Shipping. *D.D.B. Brown, S.W. Woods; Halliburton Energy Services*

10:00 am - Noon **Delaware**

MAM-B: Internal Dosimetry and Bioassay

Co-Chairs: Gary Kramer and Timothy Lynch

10:00 AM **MAM-B.1**
A Monte Carlo Evaluation of the Canadian FastScan Whole Body Counters and Comparison to Real Measurements. *G.H. Kramer, J. Fung; Health Canada*

10:15 AM **MAM-B.2**
The LLNL Phantom's Short Lungs. Are They a Problem? *G.H. Kramer; Health Canada*

10:30 AM **MAM-B.3**
On the Utility of Bioassay of Atomic Veterans. *W.J. Klemm; SAIC*

10:45 AM **MAM-B.4**
Determination of an Environmental Background Level for Strontium in Urine for the Hanford Bioassay Program. *C.L. Antonio, J.W. Rivard; Pacific Northwest National Lab*

11:00 AM **MAM-B.5**
Numerical Fitting Techniques in Support of Bioassay Data Analysis. *A.I. Apostoaei (presented by D. C. Kocher); SENES Oak Ridge, Inc.*

11:15 AM **MAM-B.6**
Dose Assessment Due to Inhalation of TENORM Containing Particles in the Phosphate Industry. *K.P. Kim, W. Bolch, E. Bolch, C.Y. Wu, W. Nall, B. Birky; University of Florida, Polk County Public Health Unit, Florida Institute of Phosphate Research*

11:30 AM **MAM-B.7**
A New Field Particle Size Sampler at USDOE Fernald. *N.H. Harley, P. Chittaporn, M.S.A. Heikkinen, R. Medora, R. Merrill; New York University School of Medicine, Fluor Fernald Radiation Control Section*

11:45 AM **MAM-B.8**
Radon and Thoron Exposure Measurements at Fernald, OH, Radium Silos. *P. Chittaporn, N.H. Harley, R. Medora, R. Merrill; New York University School of Medicine, Fluor Fernald Radiation Control Section*

10:00 am - Noon **Maryland**

MAM-C: Regulatory/Legal Issues

Co-Chairs: Kathryn Brock and Tom Essig

10:00 AM **MAM-C.1**
Enhancement of DOE Policy and Guidance for Protection of Workers in Contaminated Environments. *J.L. Rabovsky, M. Gavrilas-Guinn, D.M. Minnema, P.V. O'Connell, R.M. Loesch; US Department of Energy*

10:15 AM **MAM-C.2**
Effect of Updating Internal Dose Evaluation Methodology on Department of Energy Air Monitoring Requirements. *P.V. O'Connell; US Department of Energy*

10:30 AM **MAM-C.3**
Results of Updating Internal Dose Evaluation Methods on Department of Energy Sealed Source Accountability Requirements. *J.D. Foulke; US Department of Energy*

10:45 AM **MAM-C.4**
Overview of Radiological Protection in the Department of Energy (DOE) Since 1990. *J.L. Rabovsky, P.V. O'Connell, N. Rao; US Department of Energy*

Monday

11:00 AM **MAM-C.5**
Radiation Dose Limits in Human Research: The FDA Radioactive Drug Research Committee (RDRC). *O.H. Suleiman, R. Fejka, M. Walsh, R. Farkas, A. Janoski; Food and Drug Administration, Center for Drug Evaluation and Research (HFD-103)*

11:15 AM **MAM-C.6**
Risk Management for Decommissioning and Remediation of Radioactively Contaminated Sites. *D.J. Strom, L.R. Anspaugh, J. Flynn, F.O. Hoffman, D.C. Kocher, P.A. Locke, P.J. Merges, B.A. Napier, E.L. White; Pacific Northwest National Laboratory, University of Utah, Decision Research, SENES Oak Ridge, Inc., Johns Hopkins Bloomberg School of Public Health, Environment & Radiation Specialists, Inc.*

11:30 AM **MAM-C.7**
Expert Witnesses in Radiation Litigation. *R.H. Johnson, L.K. McKay; Schmeltzer, Aptaker & Shepard, P.C.*

11:45 AM **MAM-C.8**
An Update on the Yucca Mountain Project on the Eve of License Application. *K. Knapp, J. Shaffner; US Department of Energy*

10:00 am - Noon **Virginia**

MAM-D: Intersociety Workshop-Sharing Resources (sponsored by the Liaison Committee)

Facilitator: Earl Fordham

10:00 - 11:15 am **Washington 1**

MAM-E: External Dosimetry

Co-Chairs: Dave Medich and Chris Martel

10:00 AM **MAM-E.1**
A Dose Algorithm for an OSL-based Whole Body Dosimeter. *N. Stanford, C.N. Passmore, R.C. Yoder; Stanford Dosimetry LLC, Landauer Inc.*

10:15 AM **MAM-E.2**
Extremity Monitoring Considerations with the New Skin Dose Regulation. *J.E. DeCicco, S.S. Sherbini, K.F. Eckerman; US Nuclear Regulatory Commission, Oak Ridge National Laboratory*

10:30 AM **MAM-E.3**
VARSKIN 3: A Skin Dose Computer Code. *J.S. Durham, H. Karagiannis, S. Sherbini; Colorado State University, Nuclear Regulatory Commission*

10:45 AM **MAM-E.4**
Potential for Radiation Exposure to Airport Baggage Screeners: A Study Overview. *C. Achutan, J. Cardarelli, G. Burr; National Institute for Occupational Safety and Health*

11:00 AM **MAM-E.5**
Gamma Ray External Exposure Rates from Long-Term Storage of Plutonium Metal and Neptunium-237 Oxide. *R.L. Raabe, D.L. Burnfield, J.S. Contardi, M.J. Merritt; Texas A&M University, Defense Nuclear Facilities Safety Board*

Noon-1:30 pm **Exhibit Halls B South/C**

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits

Monday

1:30 – 3:00 pm **Exhibit Hall B South**

Poster Session

Accelerator

P.1 Dose Calculations in Reactor-Accelerator Coupling Experiments (RACE). *M.A. Reda, D.E. Beller, J.F. Harmon; Idaho State University, Idaho Accelerator Center, University of Nevada, Las Vegas*

Assessment of Radiological Computer Codes

P.2 Assessment of HOTSPOT to Identify its Attributes and Limitations When Modeling Releases of Radioactive Materials. *K.N. Beharry, R. Ali, C.D. Tillie, J.M. Nelson, E.B. Farfán, V.S. Valdes; South Carolina State University*

P.3 Improving the User Interface for the HABIT 1.1 TACT5 Module. *J.M. Nelson, K.N. Beharry, R. Ali, C.D. Tillie, V.S. Valdes, E.B. Farfán; South Carolina State University*

P.4 Assessment of RASCAL used in Modelling the Release of Radionuclides. *R. Ali, C.D. Tillie, J.M. Nelson, K.N. Beharry, E.B. Farfán, V.S. Valdes; South Carolina State University*

P.5 Assessment of the MACCS2 Module to Calculate Individual Health and Economic Effects from an Accidental Release of Radioactive Materials. *C.D. Tillie, J.M. Nelson, K.N. Beharry, R. Ali, V.S. Valdes, E.B. Farfán; South Carolina State University*

Decommissioning

P.6 The Use of Automated Detection Systems for Final Survey at the Rocky Flats Facility. *S.J. Roberts; Arcadia Consulting, Inc.*

Emergency Planning

P.7 An Overview of the Methodology and Implementation of Ohio's Potassium Iodide (KI) Distribution Plan. *D. Clum; Ohio Department of Health*

P.8 Changes of Ratio of Peripheral Neutrophils and Lymphocytes after Radiation Exposure May Serve as a Prognostic Indicator of Accident Severity. *A. Zhang, T.V. Azizova, N. Wald, R. Day; University of Pittsburgh, Southern Ural Biophysics Institute, Russia*

Environmental

P.9 Practical Application of the RESRAD-BIOTA Code at the West Valley Demonstration Project. *P.J. Hadden-Carter, C.M. Bohan, J.P. Bleech, R.E. Steiner II; URS Corporation, US Department of Energy, West Valley Nuclear Services Company*

P.10 Comparison of On-site and Off-site Radiation Exposures Associated with a Residential Farmer Scenario Using the RESRAD and RESRAD-OFFSITE Computer Codes. *J.-J. Cheng, S. Kamboj, C. Yu; Argonne National Laboratory*

P.11 Derivation of Dose Conversion Factors for Specific Organism Geometries in the RESRAD-BIOTA Code. *S. Kamboj, D. LePoire, C. Yu, S.L. Domotor, K. Higley; Argonne National Laboratory, US Department of Energy, Oregon State University*

P.12 Cancelled

P.13 Elevated Ra 226/228 Levels in Schools in Escambia County, Florida. *J.J. Lanza; Florida Department of Health*

P.14 Radiochemistry Graduate Education at Colorado State University. *S.A. Ibrahim; Colorado State University*

P.15 Teflon Coated PIPS Detector Flow Cell for Monitoring of Tc-99 in Groundwater. *L.D. Hughes, T. A. DeVol; Clemson University*

Monday

P.16 Radioecology and Environmental Health Physics: Past, Present, and Future. *D.D. Breshears, J.J. Whicker; Los Alamos National Laboratory*

P.17 Initiating a New Independent Radiological Monitoring Program In the Republic of Georgia. *N. Chelidze, R. Dunker, G. Kharashvili, S. Pagava, L. Rusetski; Idaho State University, Tbilisi State University*

P.18 Concentration and Ratio of Uranium Isotopes in the Fine-Fraction of Surface Soil from Baghdad and Basra Collected after Operation Iraqi Freedom. *A. Durakovic, A. Gerdes, I. Zimmerman; Uranium Medical Research Centre, Institute for Mineralogy, JW Goethe University*

External Dosimetry

P.19 BNL'S Experience in Establishing a Back-up Personnel Dosimetry Processor. *S. Sengupta, K.L. McMahan, R.L. Thompson, G.R. Holeman, R.N. Reciniello, H.F. Kahnhauser; Brookhaven National Laboratory, Oak Ridge National Laboratory, Holeman Consultants, Inc.*

P.20 Performance of Harshaw TLD-100H Two-Element Dosimeter. *L.Z. Luo, J.E. Rotunda; Thermo Electron Corporation*

P.21 A Revolutionary Neutron & Gamma Electronic Dosimeter. *J. Leon, R. Palatine, J.E. Rotunda; Thermo Electron Corporation*

P.22 Modification of MCNP4C to Produce Beta Spectra Following ICRU 56 Appendix D. *M.C. Nichols, B. Kahn; Georgia Power Company, Environmental Resources Center, Georgia Institute of Technology*

P.23 Monte Carlo Modeling of the Filtered Fast Neutron Irradiation System. *S. Jang, C. Kim, D. Reece, L. Braby; Texas A&M University, Hanyang University*

Instrumentation

P.24 Validation of Analytical Formulae for the Efficiency Calibration of Gamma Detectors Used in Laboratory and In-situ. *M. Abbas, M. Bassiouni; Alexandria University, Egypt, Arab Academy for Science & Tech. & MT, Egypt*

P.25 Search for Illicit Trafficking Plutonium Using Fission Neutron Detection. *A. Klett; Berthold Technologies, Germany*

P.26 Monitoring of Airborne Radioactivity at PET Centers. *A. Klett, L. DeMey, W. Erath, P. Nemecek; Berthold Technologies, Germany*

P.27 A Performance Study on a Triple-Layer Phoswich Detector for Beta Spectroscopy. *A. Tavakoli Farsoni, D.M. Hamby, S. Bush-Goddard; Oregon State University, University of Michigan*

P.28 Developing an "In-house" Default Characterization Method For In-Situ Gamma Spectroscopy. *L. Tkavadze, R. Dunker, R.R. Brey, T.F. Gesell; Idaho State University*

P.29 Type Testing of the Harshaw Model 6600(pc) TLD Reader using LiF: Mg,Cu,P. *K.J. Velbeck, L.Z. Luo, K.L. Streetz; Thermo Electron Corporation*

Internal Dosimetry and Bioassay

P.30 Values from The VIP-Man Head/Brain Model. *X.G. Xu, T.C. Chao; Rensselaer Polytechnic Institute, Chang Gung University, Taiwan*

P.31 Electron and Photon Absorbed Fractions for the Revised Pediatric Mathematical Model for Internal Dosimetry. *E.Y. Han, W.E. Bolch; University of Florida, Gainesville*

P.32 Photon Specific Absorbed Fraction Calculated in the Korean Reference Adult Male MIRD-type Phantom. *S. Park, C. Lee, J. Lee; Hanyang University, Innovative Technology Center for Radiation Safety*

Monday

P.33 GENMOD-PC: A Useful Tool of Internal Radiation Dose Assessment for First Responders in Nuclear Emergencies. *J. Chen, B.L. Tracy, R.B. Richardson; Radiation Protection Bureau, Health Canada, Chalk River Laboratory, Atomic Energy of Canada Limited*

P.34 Cancelled

P.35 Probabilistic Tests of Current ICRP Models for the Behavior of Inhaled $^{238}PuO_2$ Using Autopsy Data from USTUR Case 0259. *E.B. Farfán, T.R. La Bone, S.P. LaMont, W.E. Bolch; South Carolina State University, Westinghouse Savannah River Co., Savannah River Technology Center, University of Florida, Gainesville*

International Relations Committee

P.36 Reexamining the Health Effects of Radiation. *W. L. Chen, Y.C. Luan, T. S. Chou, W. P. Deng, M. F. Wu; National Yang-Ming University, Taiwan, Nuclear Science & Technology Association, Taiwan, Nuclear, Biological and Chemical Protection Society, Taiwan, Taipei Medical University, Taiwan, National Taiwan University, Taiwan*

P.37 Micro-analysis of Environmental Swipe, Spiked and Particle Samples as Safeguard Tools. *S.A. El-Mongy; Atomic Energy Authority- Nuclear Safety Center, Egypt, The Egyptian Armed Forces*

P.38 Breast Screening and Computed Tomography Screening: A Conflict of Radiation Safety Limits. *N. Jamal, K-H. Ng, D. Dowsett; Malaysian Institute for Nuclear Technology Research (MINT), Malaysia, University of Malaya, Malaysia*

P.39 A Comparative Study on Characteristics of Radiation Detectors Between Radiophotoluminescent Glass Dosimeters and Thermoluminescent Dosimeters. *S-M. Hsu, S-H. Yeh, M-S. Lin, W-L. Chen; Institute of Radiological Science, National Yang-Ming University, Republic of China, Institute of Nuclear Energy Research, Republic of China*

P.40 Radioecology of Slavutych. *M. Bondarkov, B. Oskolkov, A. Maksimenko; Chornobyl Center for Nuclear Safety*

P.41 Application of an Imaging Plate to Measurement of Radon Progeny Concentrations in Air. *T. Iimoto, K Kawashima, T Kosako; The University of Tokyo, Japan*

P.41A An Influence of Low Doses of X-Radiation on Chromosome Loci Displacement and DSB DNA Reparation in Human Cell Nuclei. *D.M. Spitkovsky, N.N. Veiko, A.V. Ermakov, S.M. Terekhov, Research Centre for Medical Genetics, Moscow, Russia*

Medical HP

P.42 Cancelled

P.43 Radiation Safety Considerations for Dialysis Patients Treated with I-131 Therapy Doses. *L.T. Drayton, J.E. Spann, E.D. Burch, O.X. Otukoya, S.M. Mohapatra; Washington Hospital Center*

P.44 Radiation Safety Considerations During An Implementation of Intraoperative Radiation Therapy (IORT). *H.W. Walton; Mayo Clinic Scottsdale*

Monday

P.45 Reproducibility of Manual Segmentation Applied to Computed Tomography Images of Trabecular Skeletal Sites. *T.P. Moore, D.W. Jokisch, P.W. Patton, J. Brindle, A.P. Shah, W.E. Bolch; Francis Marion University, University of Nevada-Las Vegas, University of Florida*

P.46 A Monte Carlo-Based Calculation of Effective Dose in CT Examination using Patient-Specific Models. *C. Lee, K. Jang, J. Lee; Innovatice Techology Center for Radiation Safety, Hanyang University*

P.47 The Family of Korean Anthropomorphic Tomographic Models. *C. Lee, J. Lee; Innovative Technology Center for Radiation Safety, Hanyang University*

P.48 Calculations of Organ Doses in RANDO Anthropomorphic Phantom using the BEAM Code and Monte Carlo Method. *B. Wang, C.Y. Shi, X.G. Xu; Rensselaer Polytechnic Institute*

P.49 The UF Series of Tomographic Anatomic Models of Pediatric Patients. *C. Lee, W.E. Bolch; The University of Florida*

Miscellaneous

P.50 Cancelled

Non-Ionizing

P.51 Improving Medical Laser Safety Through Laser Safety Datasheets. *G.M. Sturchio, B.E. Edwards, K.J. Wilson, G.B. Nguyen; Mayo Clinic in Rochester, Minnesota, Duke University Medical Center*

Operational HP

P.52 Beware of the Sniffers! *N.E. Newman, A. Anthony; National Institutes of Health*

P.53 Software for Reporting Effective Dose Equivalent from Gamma-Emitting Hot Particles. *X.G. Xu; Rensselaer Polytechnic Institute*

P.54 A PC-Based Radiological Toolbox. *K.F. Eckerman, A.L. Sjoreen, H. Karagiannis, S. Sherbini; Oak Ridge National Laboratory, US Nuclear Regulatory Commission*

Regulatory/Legal Issues

P.55 General License Tracking. *K.M. Brock; US Nuclear Regulatory Commission*

P.56 National Materials Program. *K.P.H. Hsueh, P.H.L. Lohaus, J.M.P. Piccone; US Nuclear Regulatory Commission*

P.57 The IAEA Code of Conduct on the Safety and Security of Radioactive Sources: Rising to the Challenge of Implementation within the United States. *T.H. Essig, C.R. Cox, J.N. Hickey; US Nuclear Regulatory Commission*

P.58 Cancelled

Risk Analysis

P.59 Calculation of Dose Coefficients for Radionuclides Produced in a Spallation Neutron Source using the ENSDF and NUBASE Nuclear Databases. *Y. Song, J. Shanahan, P. Patton, A. Arndt, C. Campbell, K. Eckerman; University of Nevada Las Vegas, Idaho State University, Oak Ridge National Laboratory*

Waste Management

P.60 The Relative Risk from Radionuclides in Sewage Sludge. *S.N. Salomon; State and Tribal Programs, US Nuclear Regulatory Commission*

P.61 A Non-Destructive, Highly Penetrating Gamma Activation Assay of Uranics and Transuranics. *V. Makarashvili, D.P. Wells, F.A. Selim, T. White, T. Roney; Idaho State University, Idaho Accelerator Center, Idaho National Engineering and Environmental Laboratory*

Monday

Works-In-Progress

P.62 The Effects of Gamma Irradiation on Arabidopsis thaliana. *T. Pixton, J. Constable, A. Huda; California State University, Fresno.*

P.63 Preparing Facilities for Risk-Informed, Performance Based Inspections. *R. Michel, N. Jacob; VA San Diego Healthcare System, Brown University*

P.64 Localized Gamma-Ray Spectrometry Measurements of School Sites in Palos Verdes, California. *L.E. Fukumoto, J.S. Duval, J.M. Fukumoto, S.L. Snyder; Palos Verdes High School, U.S. Geological Survey, Reston, VA, Consultant, Rancho Palos Verdes*

P.65 Performance of Electret Ionization Chambers in Magnetic Field. *P. Kotrappa, L.R. Stieff, T.F. Mengers; Rad Elec Inc., National Institute of Standards and Technolgy*

P.66 Electret Chambers for Measurement of Photon Exposure Levels in a 1.5 to 2.5 Microsecond Pulse Length Linear Accelerator Lab. *P.J. Demopoulos, G. Andrews, P. Kotrappa; ATL International Inc., Yale University, Rad Elec Inc.*

P.67 Simplified Method for Environmental Dose Reconstruction for the Savanah River DOE site. *N.A. Eisenberg, B. Rautzen, P.J. Demopoulos; ATL*

P.68 Instruction of Undergraduate Students in Monte Carlo Simulation. *P.C. Fulmer, D.M. Peterson; Francis Marion University & Dade Moeller and Associates*

P.69 Initial Testing and Evaluation of the Canberra iSolo System. *R.A. Kellner; Westinghouse Savannah River Company*

P.70 Comparison of Different Pulse Shape Discrimination Methods for Phoswich and CsI:Tl Detectors. *P. Chandrikamohan, T.A. DeVol; Clemson University*

P.71 New Methods for Sorting Bulk Material at High Rates. *J.J. Shonka, M.R. Marcial, J.L. Kelley, D.M. Debord, J.M. O'Brien, K. L. Murray; Shonka Research Associates, Inc.*

3:00 - 5:30 pm **Salon 3**

MPM-A: Operational Health Physics 2

Chair: Mary Dorman

3:00 PM **MPM-A.1**
Evaluation of ANSI/HPS N13.39, "Design of Internal Dosimetry Programs," for Biomedical Research Bioassay Programs. *J.P. Ring, G.M. Sturchio, A. Amundson, F. Osborne; Harvard University, Mayo Clinic in Rochester, Minnesota*

3:15 PM **MPM-A.2**
Review of a Comprehensive Radiation Safety Survey Program at a Major Biomedical Research Institution. *T.P. Johnston, N. Newman; Radiation Safety Academy, National Institutes of Health*

3:30 PM **MPM-A.3**
Sealed Source Program Overhaul at a Large University Medical Center. *B.E. Edwards; Duke University Medical Center*

3:45 PM **MPM-A.4**
Portable Survey Instrument Maintenance, Repair, and Calibration. *T.L. Mercer; National Institutes of Health*

4:00 PM **MPM-A.5**
Radioactive Materials Security at a Biomedical Research Facility. *N.E. Newman, S.M. Austin; National Institutes of Health, Radiation Safety Academy*

4:15 PM **MPM-A.6**
Implementing the New Hazardous Material Security Plans in the Academic and Medical Environment. *M.A. Charlton, J.A. Watson, C.A. Shriver; University of Texas Health Science Center at San Antonio*

Monday

4:30 PM **MPM-A.7**
Coordinating Multi-Building Laboratory Moves. *K.E. McLellan; National Institutes of Health*

4:45 PM **MPM-A.8**
The Transition from Nuclear Power Plant Health Physicist to Medical Research Health Physicist. *K.F. Ball; Radiation Safety Academy*

5:00 PM **MPM-A.9**
Methodologies and New Technologies to Reduce Heat Stress in Radiation Workers. *R.D. Cardarelli; C.N. Associates, Inc.*

5:15 PM **MPM-A.10**
Monitoring Radioiodine Exposure in a Testing Lab Environment: ASTM D3803 and Safety in the Testing Laboratory. *C.B. Summers, T. Keller, G. Glasco, B. Kovach; NUCON International*

5:30 PM RSO Section Business Meeting

3:00 - 5:00 pm **Delaware**

MPM-B: Decommissioning

Co-Chairs: Stewart Bland and Mike Davidson

3:00 PM **MPM-B.1**
Adapting the Multi-Agency Radiation Survey and Site Investigation Manual for a University/Academic Campus Laboratory Closure: A Case Study of the United States Environmental Protection Agency Facilities in Research Triangle Park, North Carolina. *T.W. Baker, T.J. Fralix, J.D. Nelson, R.T. Greene, H.B. Honerlah, K.S. Knapp; United States Environmental Protection Agency, Shaw Environmental & Infrastructure, Inc., United States Army Corps of Engineers, Booz-Allen & Hamilton, Inc.*

3:15 PM **MPM-B.2**
Decommissioning of the Harvard Cyclotron. *W.E. Irwin; Harvard University*

3:30 PM **MPM-B.3**
Current Status of Decommissioning at the Rancho Seco Nuclear Generating Station. *L.E. Brown, J.M. Newey, E.T. Ronningen; LEEDA Enterprises, Inc., NewRad, Inc., Sacramento Municipal Utility District*

3:45 PM **MPM-B.4**
Calibration of a NaI Gamma Detector for Characterization of Radiologically Contaminated Subsurface Soil. *S. Adams, S. Alderson, J. Alvarez, C. Spear; Shaw E & I, Las Vegas, Stoller Navaro Joint Venture, Las Vegas, Auxier and Associates, RTRS, Las Vegas*

4:00 PM **MPM-B.5**
Comparison of Point Kernel Radiation Shielding and Monte Carlo Radiation Transport Methods in Support of Decommissioning Gamma Surveys. *J.S. Bland; Chesapeake Nuclear Services, Inc.*

MPM-B.6 **Cancelled**

4:15 PM **MPM-B.7**
MARSSIM Decommissioning for Non-Conforming Buildings. *R.E. Turner; Radiation Safety Academy, Inc.*

4:30 PM **MPM-B.8**
The Decontamination of the "Infinity Room" at the Former Most Dangerous Building in America. *S.J. Roberts, A.W. Wolff; Arcadia Consulting, Inc., The Alpha Group, L.L.C.*

4:45 PM **MPM-B.9**
233-S Demolition Lessons Learned. *S.L. Bump; Fluor Hanford*

MPM-B.10 **Cancelled**

Monday

3:00 – 5:00 pm Maryland

MPM-C: Communication with the Media - A Panel Discussion

Facilitator: Ray Johnson

Panel:

P.A. Karam; Rochester Institute of Technology
J.G. Barnes; Rocketdyne/Boeing
T.A. Sprackland; Virtual Museum of Natural History, Editor in Chief of the International CURATOR Project

3:00 - 5:30 pm Virginia

MPM-D: Emergency Planning/ Response

Co-Chairs: Kathryn Brock and Patricia Milligan

3:00 PM MPM-D.1
Protective Action Guides for Nuclear Terrorist Incidents. *W.C. Conklin; Department of Homeland Security/Federal Emergency Management Agency*

3:15 PM MPM-D.2
Assessment and Distribution of Potassium Iodide in the Event of a Nuclear Emergency. *R.C. Whitcomb, Jr., J.M. Smith, C.W. Miller; Centers for Disease Control and Prevention*

3:30 PM MPM-D.3
Effective Training of First Responders for Homeland Security. *R.H. Johnson; Radiation Safety Academy*

3:45 PM MPM-D.4
Radiological Event Preparedness Registry (REPR): A Database for Radiation Experts to Indicate Our Availability to Assist Our Local Communities. *M.L. Meltz; University of Texas Health Science Center at San Antonio*

4:00 PM MPM-D.5
Key Components of the Incident Command System (ICS) for the Radiation Safety Professional. *G. Anastas, S. Field; Environmental Evaluation Group, New Mexico*

4:15 PM MPM-D.6
The Role of the FDA, Department of Health and Human Services and the Federal Government in Radiological Emergency Response. *M.A. Noska; U.S. Food and Drug Administration, Center for Devices and Radiological Health*

4:30 PM MPM-D.7
Easy Calculation of Gamma Exposure Rates within Homes for Shelter Assessment. *A. Brodsky; Science Applications International Corp., Georgetown University*

4:45 PM MPM-D.8
Biodosimetry Tools Supporting Medical Recording During Radiation Casualty Incidents. *C.A. Salter, K. Salomon, I.H. Levine, W.E. Jackson, R.C. Ricks, W.F. Blakely; Armed Forces Radiobiology Research Institute, Radiation Emergency Assistance Center/Training Site*

5:00 PM MPM-D.9
Ontario Nuclear Emergency Exercise 2004 and the Ministry of Labour. *A.G. Scott; Ontario Ministry of Labour - Radiation Protection Service*

5:15 PM MPM-D.10
2003 San Antonio Regional NDMS Mass Casualty Exercise: Health Physics Perspectives. *M.A. Charlton, C.A. Shriver, J.A. Watson; University of Texas Health Science Center at San Antonio*

Monday

3:00 – 5:00 pm Washington 1

MPM-E: Workshop: To Make the U.S. Transuranium and Uranium Registries (USTUR) the Best Resource They Can Be

Co-Chairs: Ronald Filipy and Barbara Brooks

Resources Available Through the USTUR: Use Them or Lose Them. *R.E. Filipy; Washington State University-Tricities*

Changing Needs in the Dosimetry of Internal Emitters. *K.F. Eckerman; Oak Ridge National Laboratory*

Comparison of Results From ICRP Models With USTUR Data Using the Probabilistic Computer Code IBUC. *E.B. Farfán, T.R. La Bone, S.P. LaMont; South Carolina State University, Westinghouse Savannah River Co., Savannah River Technology Center*

Potential Uses of USTUR Human Tissues in Cell and Molecular Studies. *A. Brooks; Washington State University-Tricities*

Tuesday

7:15 - 8:15 AM **Room: Maryland**

CEL-3 Physics, Health Physics, and Applications of Backscatter X-Ray Imaging. *D. Strom; Battelle Northwest*

7:15- 8:15 AM **Room: Virginia**

CEL-4 High Dose Irradiation of Mail and Products. *O. Suleiman, E.A. Tupin; US Food and Drug Administration, US Environmental Protection Agency*

8:30 am – Noon **Salon 3**

TAM-A: AAHP Special Session: The Role of Radiation Experts in Homeland Security, Part 1

Co-Chairs: Howard Dickson and Kathy Shingleton

8:30 AM **TAM-A.1**

Role of Radiation Experts in Homeland Security. *C.J. Paperiello; US Nuclear Regulatory Commission*

9:00 AM **TAM-A.2**

Medical and Emergency Preparedness for Acts of Radiological Terrorism: The Role of the Radiation Expert. *R.J. Hatchett; Duke University Medical Center*

9:30 AM **TAM-A.3**

New Challenges for Radiation Detection Equipment. *A.D. Dougan; Lawrence Livermore National Laboratory*

10:00 AM **BREAK**

10:30 AM **TAM-A.4**

Science and Technology with the Department of Homeland Security. *B.R. Buddemeier; Science and Technology with the Department of Homeland Security*

11:00 AM **TAM-A.5**

The U.S. National Response To Radiological Incidents. *A.L. Remick; US Department of Energy/National Nuclear Security Agency*

11:30 AM **TAM-A.6**

The Commonwealth's Nuclear and Radiological Emergency Response Program. *D.J. Allard; Pennsylvania DEP Bureau of Radiation Protection*

Noon - 1:30 PM **AAHP Luncheon**
Wilson A/B

8:30 am – Noon **Delaware**

TAM-B: Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP)

Co-Chairs: Carl Gogolak and John Griggs

8:30 AM **TAM-B.1**

Status and Availability of the Multi-Agency Radiological Laboratory Analytical Protocols Manual. *J.G. Griggs; US Environmental Protection Agency National Air and Radiation Environmental Laboratory*

9:00 AM **TAM-B.2**

Selection and Validation of an Analytical Method. *J.S. Morton; Morton Research Group*

9:30 AM **TAM-B.3**

Software for Uncertainty Propagation. *K.D. McCroan; US Environmental Protection Agency National Air and Radiation Environmental Laboratory*

10:00 AM **BREAK**

10:30 AM **TAM-B.4**

DQOs, MQOs, LLDs, MDCs, MQCs and All Those TLAs (Three Letter Acronyms). *C.V. Gogolak; USDHS Environmental Measurements Laboratory*

11:00 AM **TAM-B.5**

MARLAP - Examples and Training. *B. Hull; US Environmental Protection Agency Office of Radiation and Indoor Air*

11:30 AM **Question and Answer Panel Discussion**

Tuesday

8:30 - 11:15 am Maryland

TAM-C: Decommissioning Section Special Session

Co-Chairs: Scott Kirk and Eric Goldin

8:30 AM TAM-C.1
The Regulatory Control of Materials Containing Very Low Levels of Radionuclides: The Development of International Guidance. *G.S. Linsley; International Atomic Energy Agency (until April 2004)*

9:00 AM TAM-C.2
NRC Activities for Controlling the Disposition of Solid Materials. *A.M. Huffert; US Nuclear Regulatory Commission*

9:15 AM TAM-C.3
Approaches to Developing Additional Disposal Options for Low-Activity Radioactive Waste. *K.S. Czyscinski, R.M. Ferguson, C.E. Foutes, R.D. Joglekar, A.D. Klinger, D.J. Schultheisz; US Environmental Protection Agency*

9:30 AM TAM-C.4
Potential Radiation Doses and Health Risks from Recycling U.S. Department of Energy Scrap Metals. *W.E. Kennedy, Jr., T.A. Ikenberry, J.W. Neave, J.A. Poppiti; Dade Moeller & Associates, US Department of Energy*

9:45 AM BREAK

10:15 AM TAM-C.5
Estimated Radiological Consequences for Reactor Pressure Vessel Package Hypothetical Ocean Sinking. *E.M. Goldin; Southern California Edison*

10:30 AM TAM-C.6
The Consequences of Inadequate Source Term Abstraction to Establish Soil DCGLs - A Case History. *A.J. Nardi; Westinghouse Electric Company*

10:45 AM TAM-C.7
MARSSIM Applied to a "Non-Decommissioning" Final Status Survey. *A.L. Fellman; Radiation Safety Academy*

11:00 AM TAM-C.8
Dose Modeling and DCGL Use for Decommissioning Sites with Aquifer Contamination. *E.L. Darois, E.L. Keefer, A.C. Carson; Radiation Safety & Control Services, Inc, CN Associates*

11:15 AM Decommissioning Section Business Meeting

8:15 am - Noon Virginia

TAM-D: Uses of Dosimetry in Epidemiology Studies (National Cancer Institute - NCI)

Co-Chairs: Steven Simon and Andre Bouville

8:15 AM TAM-D.1
Use of Radiation Dosimetry in Epidemiological Studies of Cancer: An Overview. *M.S. Linet; National Cancer Institute*

8:30 AM TAM-D.2
Dosimetric Requirements for Epidemiologic Studies. *S. L. Simon, A. Bouville; National Cancer Institute*

8:45 AM TAM-D.3
Dosimetry and Risk Estimation in the Atomic Bomb Survivor Studies. *D.L. Preston, H.M. Cullings, S. Fujita, Y. Shimizu; Department of Statistics, RERF, Hiroshima, Japan*

9:00 AM TAM-D.4
Dose Reconstruction for Medical Radiation Exposures: Use in Epidemiologic Studies. *M. Stovall, R.E. Weathers, S.A. Smith, C.J. Kasper; University of Texas M.D. Anderson Cancer Center*

Tuesday

9:15 AM **TAM-D.5**
Radon Exposure Assessment and Dosimetry Applied to Epidemiology and Risk Estimation. *J.S. Puskin, A.C. James, P. Duport; US Environmental Protection Agency, ACJ and Associates, Inc., University of Ottawa, Canada*

9:30 AM **TAM-D.6**
Chernobyl Dosimetry. *N. Luckyanov, A. Bouville, P.G. Voilleque; National Cancer Institute, MJP Risk Assessment, Inc.*

9:45 AM **TAM-D.7**
Dose-Reconstruction System for the Extended Techa River Cohort. *M.O. Degteva, M.I. Vorobiova, E.I. Tolstykh, L.R. Anspaugh, B.A. Napier; Urals Res. Center for Radiation Medicine, University of Utah, Pacific Northwest National Laboratory*

10:00 AM **TAM-D.8**
Mayak Dosimetry. *K. Eckerman, J. Fix, S. Miller; Oak Ridge National Laboratory, Pacific Northwest National Laboratory, University of Utah*

10:15 AM **BREAK**

10:45 AM **TAM-D.9**
Fallout Studies Dosimetry. *A. Bouville, S.L. Simon, H.L. Beck, L.R. Anspaugh; National Cancer Institute, Retired from the Department of Energy, University of Utah*

11:00 AM **TAM-D.10**
Retrospective Assessment of Radiation Exposure in Epidemiologic Studies using Biological Dosimetry: Chromosome Painting, Electron Paramagentic Resonance and the Glycophorin-A Mutation Assay. *R.A. Kleinerman, A.A. Romanyukha, D.A. Schauer, J.D. Tucker; Radiation Epidemiology Branch, DCEG, National Cancer Institute, NIH, DHHS, Uniformed Services University of the Health Sciences, Wayne State University*

11:15 AM **TAM-D.11**
Quantification of Uncertainty in Dose Reconstruction. *F.O. Hoffman, A.I. Apostoaei, D.C. Kocher, B.A. Thomas; SENES Oak Ridge, Inc.*

11:30 AM **TAM-D.12**
Statistical Ramifications of Dose Uncertainties in Radiation Dose-Response Analyses. *D.W. Schafer, E.S. Gilbert; Oregon State University, Radiation Epidemiology Branch, Division of Cancer Epidemiology and Genetics, National Cancer Institute*

11:45 AM **Question and Answer Panel Discussion**

8:15 - 11:45 am **Washington 4**

TAM-E: Accelerator Section Special Session Part 1

Co-Chairs: Bob Casey and Sayed Rokni

8:15 AM **TAM-E.1**
Empiricism Versus Monte-Carlo. *G.R. Stevenson; CERN, Senior Physicist (retired)* ***(G. William Morgan Lecture)***

9:00 AM **TAM-E.2**
ANSI N43.1 Radiation Safety for the Design and Operation of Particle Accelerators. *L.S. Walker, J.C. Liu; Los Alamos National Laboratory, Stanford Linear Accelerator*

9:15 AM **TAM-E.3**
Radiological Design Considerations for NSLS-II. *W.R. Casey; Brookhaven National Laboratory*

9:45 AM **BREAK**

10:15 AM **TAM-E.4**
Shielding Methodology for the SPEAR3 Storage Ring and Synchrotron Beam Lines. *S.H. Rokni, J.C. Liu, H.Y. Khater, A.A. Prinz, A. Fasso; Stanford Linear Accelerator Center*

Tuesday

10:45 AM **TAM-E.5**
Skyshine at Duke Free Electron Laser Laboratory. *V. Vylet; Duke University*

11:15 AM **TAM-E.6**
Bremsstrahlung Calculations for the CAMD Facility at 200 MeV and 1.3 GeV. *L. Marceau-Day; Louisiana State University*

11:30 AM **TAM-E.7**
Activation of the NuMI Radioactive Water Systems and the Associated Radiological Issues. *K. Vaziri; Fermi National Accelerator Laboratory*

11:45 AM **Accelerator Section Business Meeting**

8:30 - 11:00 am **Washington 1**

TAM-F: ANSI/HPS N13 Session

Co-Chairs: Joe Ring and Tracy Ikenberry

8:30 AM **TAM-F.1**
An Overview of N13 Radiation Protection Standards. *J.P. Ring; Harvard University*

8:45 AM **TAM-F.2**
ANSI/HPS Standard on Fetal Dose Assessment. *M.G. Stabin, R. Blackwell, R.L. Brent, E. Donnelly, V.A. King, K. Lovins; Vanderbilt University, Mayo Clinic/Foundation, Thomas Jefferson University , MJW Corporation, Inc., Rad Physics, Inc.*

9:00 AM **TAM-F.3**
N13.59 Characterization of Land Areas and Structures in Support of Decommissioning. *E.W. Abelquist; ORAU*

9:15 AM **TAM-F.4**
Dose Limits for First Responders. *J.G. Barnes; Rocketdyne Propulsion and Power, The Boeing Company*

9:30 AM **BREAK**

10:00 AM **TAM-F.5**
ANSI/HPS N13.53 TENORM Standard - Update of Development Activities & Lessons-Learned at the Ten-Year Mark. *J.-C. Dehmel; US Nuclear Regulatory Commission, DC*

10:15 AM **TAM-F.6**
Draft ANSI Standard N13.31, Assessment of Radiation Doses from Plutonium and Americium in Soil: History and Status. *T. Buhl; Health, Safety, and Radiation Protection Division, Los Alamos National Laboratory*

10:30 AM **TAM-F.7**
ANSI N13.27: A Case Study in Developing a Performance Standard. *M.L. Johnson, J.S. Bogard; Pacific Northwest National Laboratory, Oak Ridge National Laboratory*

10:45 AM **TAM-F.8**
What is New in Standards Development? *M. Cox, L. Pibida, M. Unterweger; ANSI Committee N42, NIST*

2: 30-5: 00 pm **Salon 3**

TPM-A: AAHP Special Session: The Role of Radiation Experts in Homeland Security, Part 2

Co-Chairs: Howard Dickson and Kathy Shingleton

2:30 PM **TPM-A.1**
Medical Aspects of the Homeland Security Response. *R.E. Goans; MJW Corporation and Tulane University*

3:00 PM **TPM-A.2**
Protective Action Guides and Operating Guidelines for RDD/IND Incidents. *W.C. Conklin; Department of Homeland Security/Federal Emergency Management Agency*

3:30 PM **BREAK**

Tuesday

4:00 PM **TPM-A.3**
Cleanup and Recovery Protective Action Guides. *E.A. Tupin, J.A. Mackinney; US Environmental Protection Agency*

4:30 PM **TPM-A.4**
Handling Contaminated Cadavers. *C.M. Wood; Centers for Disease Control and Prevention*

5:00 PM **AAHP Open Meeting**

2: 30-4: 45 pm **Delaware**

TPM-B: Government Section Special Session: Lasers

Co-Chairs: Frank Bradley and Tom Johnson

2:30 PM **TPM-B.1**
Update on Laser Exposure Limits. *D.H. Sliney; US Army Center for Health Promotion and Preventive Medicine*

2:45 PM **TPM-B.2**
The Latest on 21 CFR 1040. *J.E. Dennis; CDRH/FDA*

3:00 PM **TPM-B.3**
Ocular Hazard Analysis for Pulsed Lasers. *J.K. Franks; US Army Center for Health Promotion and Preventive Medicine*

3:15 PM **TPM-B.4**
ANSI Z136.6 American National Standards for Use of Lasers Outdoors. *W.J. Marshall; US Army Center for Health Promotion and Preventive Medicine*

3:30 PM **BREAK**

4:00 PM **TPM-B.5**
Increased Use of Lasers by the Military. *S.A. Zimmerman; Naval Surface Warfare Center*

4:15 PM **TPM-B.6**
Recent Laser Bioeffects Research: Implications to Permissible Exposure Limits. *B.E. Stuck, D.J. Lund; US Army Medical Research Detachment, Walter Reed Army Institute of Research*

4:30 PM **TPM-B.7**
Trends in Laser Injury Reporting. *T.E. Johnson, K.R. Clark; Uniformed Services University of the Health Sciences, Bethesda, MD*

4:45 PM **Government Section Business Meeting**

2: 30-4: 45 pm **Maryland**

TPM-C: Medical Section Special Session

Co-Chairs: Lisa Coronado and Gary Sayed

2:30 PM **TPM-C.1**
Dose Reductions without Loss of Image Quality on Two Multislice CT Scanners. *M.F.A. Reese, M.G. Stabin, R. Price, M. Hernanz-Schulman, S.M. Stein, R.M. Heller, D.Pickens; Vanderbilt University*

2:45 PM **TPM-C.2**
Shielding and Dose Evaluation to Organs Outside CT and Fluoroscopic X-Ray Fields. *J.P. Jacobus, L. Ngutter, B. Wood, J. Oberio, Z. Neeman; National Institutes of Health, St. Louis University*

TPM-C.3 **Cancelled**

3:15 PM **BREAK**

3:45 PM **TPM-C.4**
Nurse Exposure Reduction during Computed Tomography (CT) Procedures. *K.J. Roebuck, J. Torkelson, G.M. Sturchio, J. Kofler, S. Berg, J. Miller; Mayo Clinic*

Tuesday

4:00 PM **TPM-C.5**
Uses of I-131 MIBG in Tumors of Neural Crest Origin. *J.L. West; National Institutes of Health*

4:15 PM **TPM-C.6**
Shielding Calculation and Construction for a PET/CT Facility. *S.H. King, K.L. Miller, M.C. Erdman, B.E. Achey; Penn State M.S. Hershey Medical Center*

4:30 PM **TPM-C.7**
An Alternative Radiation Risk Statement for Human Research Protocols. *R.D. Forrest, W.D. Davidson, G.M. Sturchio; University of Pennsylvania, University of Pennsylvania, Mayo Clinic*

4:45 PM **Medical HP Section Business Meeting**

2: 30-5: 15 pm **Virginia**

TPM-D: New Dosimetry and Risk Estimates for Atomic Bomb Survivors

Co-Chairs: Rick Jones and Joseph Weiss

2:30 PM **TPM-D.1**
The Scientific Program of RERF. *B.G. Bennett; Radiation Effects Research Foundation, Japan*

2:45 PM **TPM-D.2**
Reassessment of the RERF Dosimetry System - Overview of the New Dosimetry System DS02. *R.W. Young; Chairman of US Working Group for DS02*

3:30 PM **TPM-D.3**
Intercomparison Study of Thermal-Neutron Induced Eu-152 and Cl-36. *M. Hoshi; Hiroshima University, Japan*

3:45 PM **BREAK**

4:15 PM **TPM-D.4**
The Implementation of DS02 at RERF and Resulting Survivor Doses. *H.M. Cullings, S. Fujita, D.L. Preston; Radiation Effects Research Foundation, Japan*

4:45 PM **TPM-D.5**
The Impact of the Change in Dosimetry on Atomic Bomb Survivor Cancer Mortality Risk Estimates. *Y. Shimizu, D.L. Preston, D.A. Pierce, H.M. Cullings, S. Fujita, K. Kodama; Radiation Effects Research Foundation, Japan*

2: 30-5:00 pm **Washington 4**

TPM-E: Accelerator Section Special Session Part 2

Co-Chairs: Bob Casey and Sayed Rokni

2:30 PM **TPM-E.1**
Radiation Safety Studies in Support of Topoff Mode at the ALS. *R. Donahue, B. Fairchild, R. Mueller, D. Robin, C. Steier; Lawrence Berkeley Laboratory*

3:00 PM **TPM-E.2**
A Modified Bonner Sphere Technique for Measuring the High Energy Neutron Spectrum with Multiple Activation Foils. *L.S. Walker, R.H. Olsher, G.W. Cooper, R.D. Busch; Los Alamos National Laboratory, University of New Mexico*

3:30 PM **BREAK**

4:00 PM **TPM-E.3**
Neutron Skyshine Considerations for the NIF Shielding Design. *M. Singh, J. Mecozzi, M. Tobin; Lawrence Livermore National Laboratory*

4:15 PM **TPM-E.4**
Activation Products in the Cyclotron Vaults: A Paradigm Shift. *C.A. Ribaudo, D.A. Carter, M. Roberson; National Institutes of Health*

Tuesday

4:30 PM **TPM-E.5**

Development of a Dosimeter System for Linear Accelerator Beam Characterization over a Wide Range of Absorbed Doses and Absorbed Dose Rates for Radiobiological Applications. *J. Case, W. Beezhold, L. DeVeaux, D. Wells; Idaho State University*

4:45 PM **TPM-E.6**

Investigation of Optimal PCB Radiolysis using Alkaline Isopropanol. *A. Arndt, R. Brey, R. Rodriguez, B. Mincher; Idaho State University, Idaho National Engineering and Environmental Laboratory*

Wednesday

7:00 - 8:00 AM **Room: Maryland**
CEL-5 Outpatient Release of Nuclear Medicine Patients: Health Physics Aspects. *J. Siegel, M. Stabin; Nuclear Physics Enterprises, Vanderbilt University*

7:00 - 8:00 AM **Room: Virginia**
CEL-6 Radiation Health Effects in Atomic Bomb Survivors: A Review of Recent Results. *D. Preston; Department of Statistics, RERF, Hiroshima Japan*

8:00 - 11:30 am **Salon 3**

PL2: Plenary Session 2 Science Policy and Politics

8:00 AM
Health Physics Society's Government Relations Program in 2003 – 2004. *HPS President Kenneth Kase*

8:30 AM **PL2.1**
Congress' Role in Addressing the Shortage of Qualified Scientist in the Workforce. *Representative Rush Holt, (D – NJ 12th)*

9:00 AM **PL2.2**
Maintaining the Health Physics and Nuclear Sciences Infrastructure in our Universities and Academic Institutions – The Impact on a National Energy Policy. *Representative Judy Biggert, (R – IL 13th)*

9:30 AM **PL2.3**
The Role of Science in Making a Comprehensive Energy Policy. *Senator Larry Craig, (R – ID)*

10:00 AM **BREAK**

10:45 AM **PL2.4**
Challenges of Integrating Science into Policy in the Executive Branch. *Dr. John D. Graham, Administrator, OMB's Office of Information and Regulatory Affairs*

3:00 – 5:00 pm **Salon 3**

WPM-A: Workshop: Radiation Safety Without Borders: Where Have We Been and Where Are We Going?

Chair: Kevin Nelson

Speakers:
W. Kennedy; Dade Moeller & Associates
W. Stern; Department of State
A. Karam; Rochester Institute of Technology
D. Gilley; Florida Department of Health
P. Caracappa; Rensselaer Polytechnic Institute

2:30 - 5:30 pm **Delaware**

WPM-B: Instrumentation

Co-Chairs: Jerry Martin and Joe Rotunda

2:30 PM **WPM-B.1**
Real-time Environmental Radiation Monitoring at Indian Point. *L. Glander; Entergy, Indian Point Energy Center*

2:45 PM **WPM-B.2**
Detecting Neutrons in Portal Monitors - Why Source Term Definition is Important. *J.A. Chapman, B. Young, B. McElroy, S. Croft; Canberra Industries, Inc.*

3:00 PM **WPM-B.3**
Spatial Efficiency Plot for a Transportable Portal Monitor. *M. Balzer, R. Dunker, R.R. Brey, T.F. Gesell; Idaho State University*

3:15 PM **WPM-B.4**
Neutron Detection Using NaI Scintillators. *P.D. Bailey, P. Goldhagen; US Department of Homeland Security, Environmental Measurements Laboratory*

Wednesday

3:30 PM **WPM-B.5**
Ambient Dose Response of Several Standard Neutron Meters at Low Doses. *R.P. Radev, M.S. Singh, M.J. Moran; Lawrence Livermore National Laboratory*

3:45 PM **WPM-B.6**
Calibration of Neutron Reference Fields. *R.H. Olsher, R.O. Murphy, T.D. McLean, D.T. Seagraves; Los Alamos National Laboratory*

4:00 PM **BREAK**

4:30 PM **WPM-B.7**
Approximate Decision Levels, Detection Limits, and Confidence Intervals for Paired Counting. *W.E. Potter; Consultant*

4:45 PM **WPM-B.8**
Analyses of Health Physics (unknown) Transuranic Samples. *R.M. Martin, R.A. Metcalf, M.V. Vigil; Los Alamos National Laboratory*

5:00 PM **WPM-B.9**
Beta Spectroscopy and Dosimetry with a Large Area Avalanche Photodiode Module and Plastic Scintillators. *A.A. Kriss, D.M. Hamby; Oregon State University*

5:15 PM **WPM-B.10**
Evaluating a Proposed Approach to Teaching Nuclear Instrumentation Laboratories. *T. Butler, R.R. Brey; Idaho State University*

2:30 - 4:30 pm **Maryland**

WPM-C1: Special Session with the Society of Nuclear Medicine

Co-Chairs: Jerrold Bushberg and Marcia Hartman

2:30 PM **WPM-C1.1**
Radioimmunotherapy as an Outpatient Treatment in Nuclear Medicine: What are the Health Physics Implications? *J.A. Siegel; Nuclear Physics Enterprises*

3:30 PM **WPM-C1.2**
Administration of Decorporation Drugs to Treat Internal Radionuclide Contamination. *C.S. Marcus; University of California, Los Angeles*

5:00 - 5:30 pm **Maryland**

WPM-C2: Time Machine: A Radium Producer's Photo Album

Paul Frame; Oak Ridge Associated Universities
Joel Lubenau; Consultant

2:15 - 5:30 pm **Virginia**

WPM-D: Government Section Special Session: Homeland Security

Co-Chairs: Tom Bell and Ruth McBurney

2:15 PM **WPM-D.1**
Developing NCRP Recommendations for Security Screening of Humans. *K.L. Miller; Penn State Hershey Medical Center*

2:45 PM **WPM-D.2**
Radiation Safety Considerations for Use of Cargo Inspection Systems Utilizing Neutron Irradiation. *L.A. Braby; Texas A&M University*

3:15 PM **WPM-D.3**
New American National Standards for Homeland Security Applications. *C.G. Jones; US Nuclear Regulatory Commission*

3:45 PM **BREAK**

4:00 PM **WPM-D.4**
Evolution of the Agreement State Program. *C.J. Paperiello, P.H. Lohaus, K.N. Schneider; US Nuclear Regulatory Commission*

Wednesday

4:30 PM **WPM-D.5**
Update on Revised Federal Radiation Protection Guidance for the General Public. *M.A. Boyd; US Environmental Protection Agency*

5:00 PM **WPM-D.6**
NIST Work on Radiation Detectors for Homeland Security. *L. Pibida; National Institutes of Standards and Technology*

2:30 - 4:15 pm **Washington 4**

WPM-E1: Waste Management

Chair: Wayne Gaul

2:30 PM **WPM-E1.1**
Measurements of Am-241 in Savannah River Site High Cs-137 Radioactive Waste Using Diglycolamide. *T.P. Eddy, D.P. DiPrete, C.C. DiPrete; WSRC,SRTC*

2:45 PM **WPM-E1.2**
Radioactive Material Monitoring at a Solid Waste Transfer Station. *S. Austin; Radiation Safety Academy, Inc.*

3:00 PM **WPM-E1.3**
The Application of Statistical Moments to the Removal of Contaminants and Optimization of a Dynamic Waste Processing System. *W.C. Gaul; Chesapeake Nuclear Services, Inc.*

3:15 PM **WPM-E1.4**
Optimizing Transuranic Waste Characterization Requirements. *J.K. Channell, M.K. Silva; NM Environmental Evaluation Group*

3:30 PM **WPM-E1.5**
General Waste Management of Cyclotron Activities. *W.M. Rubin, C.A. Ribaudo, M. Roberson; National Institutes of Health*

3:45 PM **WPM-E1.6**
Correlation of Radiological and Chemical Contamination at Superfund Sites. *B. Littleton, A. Varghese, J. Laurenson, I. Linkov; US Environmental Protection Agency, ICF Consulting*

4:00 PM **WPM-E1.7**
Interagency Steering Committee on Radiation Standards Assessment of Radioactivity in Sewage Sludge. *K. Aiello, J.T. Bachmaier, R.K. Bastian, W.A. Chiu, D. Condra, J.A. Goodman, A.R. Jones, T. E. Lenhartt, W.R. Ott, S.N. Salomon, D. Saunders, D.W. Schmidt, A.B. Rubin, L.W. Setlow, A.B. Wolbarst, C. Yu; Middlesex County Utilities Authority, US Department of Energy, US Environmental Protection Agency, Oak Ridge Institute for Science & Education, NJ Department of Environmental Protection, US Nuclear Regulatory Commission, NE Ohio Regional Sewer District, Argonne National Laboratory*

4:15 PM **BREAK**

4:45 - 5:30 pm **Washington 4**

WPM-E2: Non-Ionizing Radiation

Chair: Greg Gorsuch

4:45 PM **WPM-E2.1**
The Health Physics of Wireless Telecommunications. *W.E. Irwin; Harvard University*

5:00 PM **WPM-E2.2**
A Simple Approach to Industrial Laser Safety. *M.A. Lewandowski, M.W. Hinz; 3M Company*

5:15 PM **WPM-E2.3**
US and International Regulations and Consensus Guidelines for Non-ionizing Radiation Safety. *S. Farmer, T.L. Mays, C.A. Dombrow; Eli Lilly and Company, Kelly Scientific Resources*

5:30 PM **Maryland**

HPS Business Meeting

ADJUNCT TECHNICAL MEETING

6:00 - 8:00 pm **Delaware**

Aerosol Measurements

(all presentations are 15 minutes)

Chair: Morgan Cox

A Simple Spreadsheet for Air Sample Calculations. *N. Kirner; Health Physics and Environmental Management for a Better Tomorrow*

The Development and Progress of Effluent Air Monitoring at the WIPP. *R. Farrell, D. Harward; Westinghouse-WIPP*

Resolutions of Concerns with WIPP Effluent Air Monitoring. *W.T. Bartlett; Portage Environmental*

Open Forum Discussion of Critical Aerosol Issues. *Moderator: M.D. Hoover; National Institute for Occupational Safety and Health*

An Overview of the Capstone Depleted Uranium Aerosol Study. *F. Szrom, M.A. Parkhurst, R.A. Guilmette, C. Brannon, P. Shebell; US Army, Aberdeeen Proving Ground, Battelle PNNL, Los Alamos National Laboratory, NIST EML-DHS*

Summary of Current Efforts of ANSI N13, ANSI N42 and ASTM E-54 in Developing and Coordinating Standards for the Department of Homeland Security. *M. Cox; Consultant.*

Closing the Gap Between Personal Air Sampling and Workplace Air Monitoring. *J.T Voss; Los Alamos National Laboratory*

Evaluation of Personal Air Monitoring Data at the Savannah River Site. *T.R. LaBone, D.J. Hadlock; Savannah River Site*

Thursday

7:15 - 8:15 AM **Room: Maryland**
CEL-7 Radioactive Cure-alls. *P. Frame; Retired, Oak Ridge Associated Universities*

7:15 - 8:15 AM **Room: Virginia**
CEL-8 Current Issues in Radiation Epidemiology - an Update. *J. Boice; Vanderbilt University*

8:30 - 9:30 am Cotillion Ballrm

THAM-A1: Risk Analysis

Chair: Mike Davidson

8:30 AM **THAM-A1.1**
Cancer Risks from Ingestion of Radiostrontium. *O.G. Raabe; University of California, Davis*

8:45 AM **THAM-A1.2**
Associations between Potential Risk Factors and Malignant Liver Cancers among Mayak Plutonium Facility Workers. *B.R. Scott, Z.B. Tokarskaya, G.V. Zhuntova, V.F. Khokhryakov, Z.D. Belyaeva, E.K. Vasilenko; Lovelace Respiratory Research Institute, Southern Urals Biophysics Institute, Russia*

9:00 AM **THAM-A1.3**
Risk Analysis for Prioritization of LANL Nuclear Material Repackaging. *J.A. Sattelberger, H. Jordan, P.H. Smith; Los Alamos National Laboratory*

9:15 AM **THAM-A1.4**
Consequences of the Stochastic Nature of Risk. *F.A. Seiler, J.L. Alvarez; Sigma Five Consulting, Auxier & Associates*

9:30 AM **BREAK**

10:00 - 11:30 am Cotillion Ballrm

THAM-A2: Dose Reconstruction and History

Co-Chairs: Hal Peterson, Jr. and Paul Stansbury

10:00 AM **THAM-A2.1**
Revisiting the Three Mile Island Accident After 25 Years. *H.T. Peterson, Jr.; Consultant*

10:15 AM **THAM-A2.2**
Uncertainty in Radiation Dose Reconstruction from Medical X-Rays. *D.J. Strom, J.B. Martin; Battelle Northwest*

10:30 AM **THAM-A2.3**
The Effects of Apron Use on Organ Dose Reconstruction for Workers at a Weapons Assembly/Disassembly Facility. *P.S. Stansbury, D.J. Strom, C. Passmore; Battelle Northwest Division, Landauer, Inc.*

10:45 AM **THAM-A2.4**
An Assessment of Doses due to Historical Atmospheric Releases of Radionuclides from the Chemical Processing Plant at Idaho National Engineering Laboratory. *A.I. Apostoaei, B.A. Thomas, D.C. Kocher, F.O. Hoffman; SENES Oak Ridge, Inc.*

11:00 AM **THAM-A2.5**
Interim Report of the Los Alamos Historical Document Retrieval and Assessment Project. *T.E. Widner, J.J. Shonka, J.M. O'Brien, Jr., J.E. Buddenbaum, R.E. Burns, Jr.; ChemRisk, Inc., Shonka Research Associates, ENSR Corporation*

11:15 AM **THAM-A2.6**
Russian Human Radiobiology Tissue Repository for the Exposed Mayak PA Workers. *K.N. Muksinova, E.N. Kirilova, V.S. Revina, M.L. Zakharova, S.N. Sokolova, R. Neta; Southern Urals Biophysics Institute, US Department of Energy*

Thursday

8:30 am - Noon Delaware

THAM-B: Special Session: Low Dose Radiation Research

Co-Chairs: Antone Brooks and Dan Strom

8:30 AM THAM-B.1
Genetic Susceptibility to Radiation-Induced Cancer and its Potential Impact on Radiation Risk. *R.L. Ullrich; Colorado State University*

9:00 AM THAM-B.2
The Bystander Effect; A Paradigm Shift in Interpreting Radiation Effects. *E.J. Hall; Columbia University*

9:30 AM THAM-B.3
Molecular Mechanisms and Cellular Consequences of Exposure of Mammalian Cells to Low Dose Ionizing Radiation. *A.J. Wyrobeck, M.A. Coleman, C. Manohar, F. Marchett, D. Nelson, L. Peterson; BBRP, Lawrence Livermore National Laboratory, Baylor College of Medicine*

10:00 AM BREAK

10:30 AM THAM-B.4
Where Have All the Thresholds Gone? *A.L. Brooks; Washington State University Tri-Cities*

11:00 AM THAM-B.5
Low Doses and Risk in vivo. *R.E.J. Mitchel; Radiation Biology and Health Physics Branch, Atomic Energy of Canada Limited, Chalk River Laboratories, Canada*

11:30 AM THAM-B.6
Cancer Risks at Low Radiation Doses – What Do We Really Know? *D.J. Brenner; Columbia University*

8: 30 am - Noon Maryland

THAM-C: Military Health Physics

Co-Chairs: George Anastas and Bob Cherry

8:30 AM THAM-C.1
What is Military Health Physics? *R.N. Cherry; Dade Moeller and Associates*

8:45 AM THAM-C.2
Military Health Physics in the Manhattan Project. *P. Myers, B. Cherry, J. Taschner, P. Frame; Texas Department of Health, Bureau of Radiation Control, Dade Moeller & Associates, Retired, Oak Ridge Associated Universities*

9:15 AM THAM-C.3
The History of Health Physics in the Public Health Service. *J.C. Villforth; RADM (Retired) US Public Health Service*

9:45 AM BREAK

10:00 AM THAM-C.4
History of Military Health Physics in the Army. *R.E. Eng; US Army Medical Command*

10:30 AM THAM-C.5
History of Military HP in the Navy. *G.M. Gorsuch; Medical Service Corps, United States Navy*

11:00 AM THAM-C.6
A Touch of Air Force History. *K.K. Mather; Air Force Medical Support Agency, Office of the Surgeon General*

11:30 AM THAM-C.7
Evolution of Non-Ionizing Radiation Programs: The Early Contributions of the Military Services. *D.H. Sliney; US Army Center for Health Promotion and Preventive Medicine*

Thursday

8:30 - 11:45 am Virginia

THAM-D: Environmental

Co-Chairs: Kathy Higley and Laura Gonzales

8:30 AM THAM-D.1
Experiences in Stack Monitor Testing under ANSI/HPS N13.1-1999. *A.M. Bird, J.R. Fox, E.D. Picazo, D.M. Scalise, A.K. Shukla; US Department of Energy, URS Corporation, West Valley Nuclear Services Company*

8:45 AM THAM-D.2
Measured Deposition in Research Facility Stack Sampling Systems. *M.Y. Ballinger, D.D. Douglas, J.M. Barnett; Battelle Seattle Research Center, Pacific Northwest National Laboratory*

9:00 AM THAM-D.3
Radioxenon Monitoring in Three Distinctive Environments: Ottawa, Tahiti, and Yellowknife. *T.J. Stocki, X. Blanchard, R. D'Amours, R.K. Ungar, J.P. Fontaine, M. Sohier, M. Bean, T. Taffary, J. Racine, B.L. Tracy, G. Brachet, M. Jean, D. Meyerhof; Radiation Protection Bureau, Canada, Département Analyse Surveillance Environnement,Bruyères-le-Châtel, France, Canadian Meteorological Centre, Canada*

9:15 AM THAM-D.4
Validation of the CAEROT Code: 3-D Aeorosol Transport and Deposition in Confined Atmospheres. *E. Sajo, H. Park, L.M. Scott; Louisiana State University, Georgia Institute of Technology*

9:30 AM THAM-D.5
Establishing Uranium Migration Parameters for a Mojave Desert Test Range. *C. Abell, W.H. Johnson, B.J. Buck, P. Patton; University of Nevada, Las Vegas*

9:45 AM BREAK

10:15 AM THAM-D.6
Ecological Risk Assessment of Radiological Exposures to Depleted Uranium in Soils at Two Sites at a Naval Air Weapons Station. *J.-J. Cheng, C.L. Tsao, I. Hlohowskyj; Argonne National Laboratory, CH2M Hill*

10:30 AM THAM-D.7
The RESRAD-BIOTA Code: A Tool for Implementing a Graded Approach to Biota Dose Evaluation. *S.L. Domotor, C. Yu, K.A. Higley, D. LePoire, S. Kamboj, T. Klett, J.J. Cheng; US Department of Energy, Argonne National Laboratory, Oregon State University*

10:45 AM THAM-D.8
The U.S. Department of Energy's Framework for Demonstrating Radiation Protection of the Environment: Implementation at the Hanford Site. *K.A. Higley, E.J. Antonio, S.L. Domotor; Oregon State University, Pacific Northwest National Laboratory, US Department of Energy, DC*

11:00 am THAM-D.9
The Radon Deficit Technique for Evaluating Remediation of NAPL Contaminates in Groundwater. *W. Boyd, B. Starr, R.R. Brey; Idaho State University, North Wind Inc.*

11:15 AM THAM-D.10
Plutonium Transport in the Unsaturated Zone at the Savannah River Site: Comparison of Lysimeter Data with Theory. *R.A. Fjeld, D.I. Kaplan, D.I. Demirkanli, F.J. Molz, B.A. Powell; Clemson University, Westinghouse Savannah River Company*

11:30 AM THAM-D.11
Radioprotection of the Environment: On the Interpretation of Endpoints. *B. Cedervall, B.L. Hamrick; Medical Radiation Physics, Karolinska Institutet, and SwedPower, Sweden*

Thursday

8:30 - 10:15 am Washington 4

THAM-E1: Medical HP

Co-Chairs: Dave Medich and Chris Martel

8:30 AM THAM-E1.1
Treating I-131 Therapy Patients up to 150 mCi as Outpatients, A Myth or Reality? *J.E. Spann, L.T. Drayton, E.D. Burch, O.X. Otukoya, S.M. Mohapatra; Washington Hospital Center*

8:45 AM THAM-E1.2
An Evaluation of Thyroid Bioassay Requirements for a Large Midwestern Health System. *A.M. Jackson; Henry Ford Health System*

9:00 AM THAM-E1.3
Iodine, Cats and Iowa – A Basis for Regulatory Release Requirement Change. *T.L. Zimmerman, K.G. Miles, D. Woodruff, S.A. Simpson; Iowa State University, Avondale Veterinary Clinic*

9:15 AM THAM-E1.4
Dual Energy X-ray Absorptiometry Use in Determining Body Composition of Student Athletes. *J. Wyler, L. Golding, L. Kruskall, L. LaPorta-Krum, P. Patton; University of Nevada, Las Vegas*

9:30 AM THAM-E1.5
Study of X-ray Scattering Using Monte Carlo Method and the VIP-Man Anatomical Model. *M. Winslow, X.G. Xu, W. Huda, K. Ogden; RPI, SUNY UMC*

9:45 AM THAM-E1.6
A Tomographic, Anthropomorphic Newborn Phantom for Diagnostic Dosimetry in Pediatric Radiology. *A.K. Jones, T.A. Simon, M.M. Holman, D.E. Hintenlang, W.E. Bolch; University of Florida*

10:00 AM THAM-E1.7
The Effect of Edge Spread Function Length on the Modulation Transfer Function. *C.D. Pitcher, D.E. Hintenlang, M.M. Arreola; University of Florida*

10:15 AM BREAK

10:45 am - Noon Washington 4

THAM-E2: Radon

Chair: Bill Kennedy

10:45 AM THAM-E2.1
Radon Inverse Dose-Rate Effect and Implications to High LET Galactic Hazards. *B.E. Leonard; International Academy*

11:00 AM THAM-E2.2
Natural Radiation Exposure and Radon Exhalation From Building Materials. *C. Papastefanou, S. Stoulos, M. Manolopoulou; Aristotle University of Thessaloniki, Greece*

11:15 AM THAM-E2.3
Interparticle and Intraparticle Diffusion of Radon Through Different Qualities of Activated Carbon at Different Temperatures in a Dynamic System. *W.C. Gaul; Chesapeake Nuclear Services, Inc.*

11:30 AM THAM-E2.4
Effect of Source and Environmental Related Factors on Rn-222 Air Concentration. *A.M. Mamoon; Egyptian Atomic Energy Authority Cairo, Egypt*

11:45 AM THAM-E2.5
Development of an Apparatus for Determining a Radon Correction Factor for Electret Ion Chambers Sealed in Impermeable Containers. *B. Young, R. Dunker, T.F. Gesell, R.R. Brey; Idaho State University*

ADJUNCT TECHNICAL MEETING

1:30 pm Maryland Suite

Public Hearing For New Radiological Instrument Standards For Homeland Security Applications

Chair: Morgan Cox

ANSI Standard For Training Homeland Security Responders Using Radiation Detection Instruments. *M. Cox, Consultant*

ANSI Standard For Portal Monitors With Gamma Spectroscopic Capabilities. *P. Chiaro, ORNL*

ANSI Standard For Data Formatting From Radiation Detectors For Homeland Security Applications. *L. Pibida, NIST*

ANSI Standard For Portable Neutron Detectors For Homeland Security Applications. *A. Thompson, NIST*

AAHP Courses

Saturday, July 10, 2004

AAHP Course 1: MARSSIM and MARLAP: Underlying Processes and Unifying Concepts. *Carl V. Gogolak; US Department of Homeland Security, Environmental Measurements Laboratory, New York*

The foundation of both MARSSIM and MARLAP is directed planning and assessment, using the Data Quality Objectives (DQO) and Data Quality Assessment (DQA) processes. These have been applied to survey design and analysis for remediation and decommissioning, but are actually much more widely applicable. The unifying concept is that data is being used to make a decision. Since there is some uncertainty in all data, there is also some uncertainty in the decision-making process. Both uncertainty in the measurement process and spatial and temporal variability contribute to the overall uncertainty in the data. How much uncertainty can be tolerated depends on the consequences of making a decision error. The need to control the probability of making decision errors determines how much data of what kind is needed, and how good that data needs to be. Methods for evaluating and expressing measurement uncertainty are described in the ISO/GUM. A Measurement Quality Objective (MQO) can be specified as the required method uncertainty for the measurements. Spatial and temporal variability can be influenced by when, where, and how many samples are taken.

This course will use a workshop approach to explore the process of planning sample collection, specifying the measurements to be made and analyzing the data. The objective is to correctly choose among alternative actions that will be based on the information contained in the data. Participants are encouraged to bring example problems of their own to work on and share. Computer simulations will be used to illustrate some of the principles involved. Software tools that are available to aid planning and analysis will be discussed. A laptop computer with a spreadsheet will be useful but not required.

AAHP Course 2: Reviewing the US Transportation Regulations After the Recent Amendments to "Harmonize" with IAEA TS-R-1. *Al Grella; Grella Consulting, Locust Grove, VA*

The objective of this course is to provide an update and review of the nuclear transportation regulations of the USA *after* the January 24 amendments of DOT (49 CFR) and NRC (10CFR71) to conform, e.g. "harmonize" with the most recent IAEA safety standards of TS-R-1 (formerly referred to as ST-1). TS-R-1 standards have now been adopted by member states of IAEA and international transport regulatory bodies, e.g. IATA, ICAO, IMO, etc. Whether experienced in nuclear transport activities, or just a beginner, successful completion of this course will provide the attendee with a firm basis of technical knowledge and an understanding of the current DOT and NRC regulations, emphasizing the details of the recent amendments and their impacts. The course is also designed to assist a Hazmat Employer in his triennial certification of his Hazmat Employees as being properly trained pursuant to 49 CFR Part 172, Subpart H. A "self-test" is also provided to each attendee. The course notes to be provided have been designed to complement the visuals and also to serve as a comprehensive and useful information resource for future use in applying the regulations in practice. Since copies of the 49CFR and 10CFR Part 71 regulations are not provided, each attendee is encouraged

to bring their own copy of each of those regulations to the class and also to obtain and bring along copies of the January 26, 2004 Parts II and III of the *Federal Register* containing the "harmonization" amendments.

AAHP Course 3: Low Dose Risks of Ionizing Radiation. *Otto G. Raabe; University of California, Davis*

There is continuing controversy in the radiation safety community concerning possible cancer risks, if any, associated with low doses of ionizing radiation. Imaginary cancer risk estimates for trivial doses are routinely calculated and used for regulatory and safety purposes by various entities including International Commission on Radiological Protection (ICRP) and the U.S. Environmental Protection Agency (EPA) based on conceptual linear-no-threshold (LNT) models. Also, various antinuclear activist groups use LNT estimates of risk for opposing nuclear power, radioactive waste disposal, and most radiological technologies. In contrast, there are considerable data that show that radiation risk drops dramatically below the LNT predictions at low doses and that there may even be some beneficial effects. There are both human data and animal experimental results that convincingly show these phenomena. However, the firm confidence of many in the LNT model in concert with the mathematical methods of the Radiation Effects Research Foundation (RERF) perpetuates the LNT myth. International recommendations, radiation protection standards, national and international policy, and radiation safety practice are all affected by these views of the potential risks associated with human exposure to low doses of ionizing radiation. This lecture is a collage of the elements that compose the fabric of knowledge concerning risks of low-doses of ionizing radiation along with the underlying models of radiation carcinogenesis and genetic alterations. All of these issues will be laid out and systematically discussed. Ultimately, the direction of many important societal options that may significantly affect human welfare in the 21st Century such as the use of nuclear power, food irradiation, scientific research goals, and expenditures of portions of our national wealth for environmental restoration, will depend on our understanding of low-dose radiation risks.

Professional Enrichment Program

Sunday, July 11 Through Wednesday, July 14, 2004

The Professional Enrichment Program (PEP) provides a continuing education opportunity for those attending the Health Physics Society Annual Meeting. The two hours allotted each course ensure that the subjects can be discussed in greater depth than is possible in the shorter programs offered elsewhere in the meeting.

On Sunday, July 11, a series of 24 courses will be offered between 8:00 am - 4:00 pm.

In addition to the above-mentioned sessions for Sunday, five or six PEP lectures are scheduled on Monday, Tuesday, and Wednesday afternoons from 12:15 - 2:15 pm.

Registration for each two-hour course is $60 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the pre-registration deadline will be sent confirmation of their PEP course registration.

Students with a current ID card will be admitted free of charge to any sessions which still have space available after the waiting list has been admitted. Student admission will be on a first-come, first-served basis and will only begin 15 minutes after the start of the session to allow for completion of ticket processing.

Please Note!!

Please be on time for your sessions. The lecturer will begin promptly at the scheduled time. Please allow time for check-in. The HPS reserves the right to schedule a substitute speaker or cancel a session in case the scheduled speaker is unavailable.

Attendees not present at the starting time of the session cannot be guaranteed a space, as empty spaces will be filled from the wait list at that time. Spaces left after the wait list has been admitted may be filled with students. If your duties at the meeting cause you to be late for your lecture (e.g., chairing a session), contact the PEP registration desk so that your name can be placed on the waiver list and your space held.

SUNDAY - 8:00 -10:00 AM

1-A Department of Energy's Transportation Emergency Preparedness Program (TEPP) Train-the-Trainer Course, Part I. ***T. Clawson; Lawrence Livermore National Laboratory***

The US Department of Energy's Transportation Emergency Preparedness Program (TEPP) Modular Emergency Radiological Response Transportation Training (MERRTT) is now in its second generation (as of 2002). These materials are excellent training for first responders who may have to respond to a radiological incident. Filled with original graphics, photos, movies, student materials, and exercises, this program was designed with the assistance of first responder training experts in order to be seamlessly integrated into fire department and HAZMAT training programs.

Those that successfully complete this TEPP MERRTT Train-the-Trainer course will be given all of the presentations, student guides, instructor manuals, practical exercises, and tests electronically so that they can incorporate the material into your own training efforts.

Here are some of the modules that are in the program: Radiological Basics; Biological Effects of Ionizing Radiation; Hazard Recognition; Initial Response Actions; RAM Shipping Packages; Patient Handling; Notifications and Resources; Scene and Incident Control; Radiological Terminology and Units; Radiological Instrumentation; Assessing Package Integrity; DOE & WIPP Shipment Concerns.

Note: This is usually a 2 day course; however special dispensation has

been made for Health Physicists. In order to become a certified instructor and receive the TEPP MERRTT materials, BOTH sessions must be taken. Also see PEP Course 3-A for WMD Awareness Instructor certification.

1-B Implementation of the ICRP Publication 68 Series of Models and Dose Coefficients. ***C. Potter; Sandia National Laboratories***

In 1994, the International Commission on Radiological Protection (ICRP) published a replacement of ICRP Publication 61. This volume included dose coefficients derived using the latest recommendations from ICRP Publication 60 and incorporating the ICRP Publication 66 respiratory tract model and newer metabolic models. Implementation of this publication requires intake retention fractions derived from those models used in the publication. Fractions for particulate inhalation were made available in the November, 2002 issue of Health Physics.

This PEP course will explain the use of these dose coefficients and intake retention fractions in internal dosimetry. Topics for discussion include: 1) models used and information provided in both publications, 2) techniques for derivation of intake retention fractions, and 3) use of the dose coefficients and intake retention fractions in both dose calculation and bioassay program development.

The target audience for this course is currently performing internal dosimetry calculations in an occupational setting and anticipating moving to the more current models. However, the material will be presented in such a manner that anyone with an interest in internal dosimetry can obtain information on current models and techniques. (Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company for the United States Department of Energy's National Nuclear Security Administration under contract DI-AC04-94AL85000.)

1-C DOT Regulatory Changes Affecting Radioactive Material Shipments. ***S. Austin; Radiation Safety Academy, Inc. and F. Ferate, Department of Transportation***

2003 and 2004 have been challenging years for persons involved in shipping radioactive materials. There have been numerous regulatory changes that clarify the applicability of the Hazmat regulations and affect compatibility with international regulations, Hazmat security, worker training, hazard communication, packaging, and incident reporting. U.S. regulations have been updated to better conform to established international regulations. However, differences remain concerning certain naturally-occurring radioactive materials and some radionuclides shipped domestically. The applicability of the hazardous materials regulations were clarified concerning the loading, unloading and storage of Hazmat. Security plans may be required for certain shipments and training requirements have been updated to reflect this. The definition for LSA-I materials has changed. Certain DOT specification packages are to be phased out. Nuclide-specific exemption activity concentrations and consignment activity levels have been adopted from international regulations. This session will review these and other changes and foster discussion between course participants.

1-D Update on Radiation Dosimetry Management: Dosimeter Characteristics, Quality Assurance, and Investigations. ***S. Perle; Global Dosimetry Solutions, Inc.***

In a litigation-prone society, it is prudent for any business to evaluate its potential exposure to legal action, initiated by either an employee or a member of the general public. This potential is exacerbated when the phobia of radiation exposure and radioactive materials is interjected into the equation. This phobia is fuelled by the perceived risks of radiation

exposure, be they fact or fantasy. With the current cancer incidence rate being approximately 1 in every 2.5 individuals (for all types of cancer), it is imperative that all facilities take a proactive look at their business vulnerability. When radiation exposure is the issue, records documentation is a critical factor, and a significant amount of effort should be expended to implement a comprehensive records management system. A comprehensive Radiation Dosimetry Management Program is essential if a business is going to mitigate any regulatory or legal intervention. This PEP session will focus on the basic configuration of various types of dosimeters, i.e., TLD, film ,CR39 and criticality accident dosimetry, and the appropriate applications for which each should be selected for personnel use. Also addressed will be the appropriate Quality Assurance activities focused for each type of dosimeter, and, the appropriate requirements for investigations of dosimetry results, records quality management and software quality assurance.

1-E Health Effects and Radiation Protection. ***C. Greenstock; Atomic Energy of Canada Limited***

Exposure to ionizing radiation can result in a variety of biological effects including cancer and cell death. These effects are dependent upon the nature of the radiation and the overall biological response, particularly DNA repair, apoptosis, immunotolerance and antioxidant defenses. The results of acute vs chronic exposure, effects of dose, dose-rate and radiation quality, will be described. Data from such experiments and A-bomb survivors provide the foundation for new regulations and dose limits based on ICRP 60.

The lecture will give an historical perspective, and provide the audience with basic principles and concepts. The talk will describe the interaction of radiation with biological targets, mechanistic insight into radiation damage, and details of those factors that influence their biological consequences. These include the radio-biological oxygen effect, split-dose recovery and DNA damage control, triggered low-dose stimulation and the adaptive response, cell signaling and bystander effects, genetic instability and gene induction.

In bio-monitoring of unplanned events or emergencies, it is important to distinguish between radiation dose and biological risk. How do we set safe limits? This task is compounded by the stochastic nature, long latency and high, variable non-radiological background of generic health effects. Also, there is an on-going debate over a linear versus threshold response at low doses. Of all the hazards, why is the ALARA principle only applied to ionizing radiation? The importance of dietary chemoprotectors and other biological response modifiers and environmental and genetic determinants of individual radiosensitivity in the fields of radiation protection, regulatory limits and epidemiological risk estimation, will be discussed.

1-F Detection and Interdiction for Public Protection from Terrorism. ***R. Kouzes; Pacific Northwest National Laboratory***

Countries around the world are deploying radiation detection instrumentation to interdict the illegal shipment of radioactive material crossing international borders at land, rail, air, and sea ports of entry. These efforts include deployments in the US and a number of European and Asian countries by governments and international agencies. Items of concern include radiation dispersal devices (RDD), nuclear warheads, and special nuclear material (SNM). Radiation portal monitors (RPMs) are used as the main screening tool for vehicles and cargo at borders, supplemented by handheld detectors, personal radiation detectors, and x-ray imaging systems.

Some cargo contains naturally occurring radioactive material (NORM) that triggers "nuisance" alarms in RPMs at these border crossings. Individuals treated with medical radiopharmaceuticals also produce nuisance alarms and can produce cross-talk between adjacent lanes of a multi-lane deployment. The operational impact of nuisance alarms can be significant at border crossings. Methods have been developed for reducing this impact without negatively affecting the requirements for interdiction of radioactive materials of interest.

Plastic scintillator material is commonly used in RPMs for the detection of gamma rays from radioactive material, primarily due to the efficiency per unit cost compared to other detection materials. The resolution and lack of full-energy peaks in the plastic scintillator material prohibits detailed spectroscopy. However, the limited spectroscopic information from plastic scintillator can be exploited to provide some discrimination. Energy-based algorithms used in RPMs can effectively exploit the crude energy information available from a plastic scintillator to distinguish some NORM. Whenever NORM cargo limits the level of the alarm threshold, energy-based algorithms produce significantly better detection probabilities for small SNM sources than gross-count algorithms.

This presentation discusses experience with RPMs for interdiction of radioactive materials at borders. Results of observations of NORM and computations related to NORM characteristics will be discussed as will the use of energy-based algorithms for NORM rejection. Studies to consider the limitations of plastic scintillator versus NaI(Tl) for primary border screening applications will also be presented.

1-G Technical Auditing for Health Physicists. ***R. Cummings; Idaho National Engineering Environmental Laboratory***

This course provides information to individuals interested in the HPS accreditation program, and is also part 1 of a 2-part course for certifying individuals to audit laboratories for HPS accreditation. The objective of this professional enrichment program topic is to provide a framework around which the participant can help customers (auditees) improve through the process of technical auditing. Technical auditing requires an auditor to know what's important in an industry and where to help the auditee focus resources for optimization of the production process. The audit philosophy espoused during this training will be that compliance and conformance only form the bedrock from which a business can improve and optimize operations. The participant will learn that the "why" is the most important part of the audit in helping the auditee understand the "how" of improvement. The audit process is presented around the Plan-Do-Study-Act model. Techniques will be presented to assist auditors communicate with the team, the customer, interviewees and the sponsoring organization. The presentation is general enough to apply to audits in all health physics areas.

1-H Media Communications: Practice Your Interview Skills. ***T. Sprackland; Freelance Journalist***

What do you do when you answer your phone and a reporter is on the other end? What do you do when a member of the general public asks you a question? What do you do when you are the designated technical expert standing behind the public relations person? How do you communicate with someone outside of your field of expertise? You have taken all the communications courses, you have been briefed by your supervisors, but have you practiced? Have you practiced *lately*?

Communication outside of our personal comfort zone under pressure is a skill that safety professionals work to eliminate. Realistically, it is still a needed skill. This session is designed to be a "safe" place to practice and improve these skills under the coaching of an experienced journalist. Ms. Sprackland, a freelance journalist who represents the United Press International (UPI) wire service in Colorado, is also a correspondent for Nikkei Electronics Asia and SmallTimes, a nanotechnology magazine and website. She specializes in reporting on the energy and high-tech industries. She was regional reporter for Energy User News, covering the nuclear power and petroleum industries as well as end user case histories.

Sunday - 10:30 AM - 12:30 PM

2-A Department of Energy's Transportation Emergency Preparedness Program (TEPP) Train-the-Trainer Course, Part II

See abstract for PEP Course 1-A. Also see PEP Course 3-A for WMD Awareness Instructor certification.

2-B Uncertainty in Inferences We Make from Radiation Measurements: Counting Statistics and Other Uncertainties. ***D. Strom; Pacific Northwest National Laboratory***

The stochastic nature of the radioactive decay process leads to uncertainty in results from radiometric measurements of radioactivity. There are many other sources of uncertainty that may sometimes dwarf the effects of counting statistical uncertainties. Distinct and often-confused concepts such as uncertainty, variability, and error are defined. This course covers basic statistical concepts of underlying populations, samples from populations, and statistical distributions (binomial, Poisson, normal, and lognormal). Concepts of prevalence, sensitivity, specificity, positive predictive value, negative predictive value, and false positive and false negative rates are introduced. Using these tools, the course covers the forward problem (if a population behaves in a particular way, what set of observations would be expected?) and the reverse problem (given a set of observations, what could have been the behavior of the underlying population?). The reverse problem is stated in Bayesian terms. One kind of inference is the decision that activity above background is or is not present. Another kind of inference is the decision that activity is present above an expected distribution of environmental levels, e.g., workplace exposure to uranium as inferred from urinalysis. Such inferences can be expressed probabilistically, and this practice is becoming more and more common. Problems such as those encountered in historical dose reconstruction are used to illustrate these concepts. Simple, real-time Monte Carlo procedures using Crystal Ball™ (Decisioneering Inc.) illustrate methods of handling these problems. Methods of revealing uncertainties in models and the impact of biological variability are presented in the context of bioassay. Metaanalysis and averaging are presented as methods of pooling data to reduce uncertainty.

*Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle under Contract DE-AC06-76RLO 1830.

2-C Multi-Detector CT (MDCT) Dosimetry – Current Issues and Challenges. ***T. Yoshizumi; Duke University***

The purpose of this course is to present new dosimetry information in multi-detector CT scanners. The field of computed tomography (CT) has been revolutionized by technical advances since the introduction of multi-detector CT scanners (MDCT) in 1998. In clinical front, CT angiography (CTA) is becoming important;

we will discuss latest CTA dosimetry for screening of coronary artery diseases in reference to cardiac cath procedures. This information is extremely relevant to the risk statements in IRB applications. We will review how to estimate effective dose and organ doses and discuss their limitations. We will discuss progresses made in pediatric CT dose reductions. There is a trend of manufacturing higher tube load with shorter tube rotation time. We will provide preliminary dosimetry data when larger patients are scanned under the shorter tube to skin distance. We will discuss new information on dose to the fetus in MDCT scanners at gestation stages (at 0 and 3-mo). Finally, we will review key references in understanding radiation risks from CT procedures.

This course will present: (1) A brief overview of recent technological advances in multi-detector CT scanners; (2) A review of various dose indexes such as CTDI, weighted CTDI, and dose-length product (DLP); will discuss new CTDI formulations in MDCT environment; (3) Factors influencing radiation dose; (4) A review of various CT dose estimation methods including a Monte Carlo method and state-of-the-art real-time MOSFET measurements; (5) A review of current dosimetry issues in pediatric CT, in particular, we will review color-coded format developed at Duke University; (6) Dosimetry of large patients under increasing tube load vs. faster tube rotation; (7) New information in fetal dosimetry in pregnant woman; (8) Literature reviews on radiation risk issues from CT.

The student should expect to benefit from the course by gaining basic understanding of recent technological advances of CT, of how to estimate effective dose and organ doses in MDCT scanners, and more importantly, where to look for information pertaining CT technology and CT dosimetry.

2-D The Risks of Radiation Exposure During Pregnancy: Controversies Involving the Risk of Mental Retardation and Cancer Following Intrauterine Radiation Exposure. ***R. Brent; Jefferson Medical College, duPont Hospital for Children***

Investigators in the field of ionizing radiation risks respond to concerns from the public and scientists in other fields by stating the truism that we know more about radiation risks than the risks of all other reproductive toxins. And that happens to be true. But we also recognize that there are still unanswered questions pertaining to the magnitude of some of these risks, especially at low exposures. These questions will be discussed. 1) What are the risks of mental retardation following intrauterine radiation? Can mental retardation be induced in the radiated embryo before the 8th week of development? How do you appropriately counsel patients about this risk? 2) Will we ever know the risk of leukemia from radiation exposures to the embryo? Since many patients are concerned about cancer following intrauterine radiation, ho do you explain these risks so that they can continue the pregnancy without persistent anxiety? 3) Do we know the threshold dose during the most sensitive stage of development for the induction of major malformations of the brain and viscera? 4) Is the recommendation that women or pregnant women in the workplace should not receive more that 5 mSv per month? In recent months HPS website has been receiving as many as 3-4 questions each day dealing with various reproductive problems. The questions pertain to gestational exposures to ionizing radiation that frequently involve the questions and controversies listed above. In spite of the fact that we do not have all the answers and that some issues are controversial, it may be surprising to many that appropriate counseling can be provided to most patients and physicians who seek advice.

2-E HPS Laboratory Accreditation Program Assessor Training. ***K. Swinth, R. Cummings; Idaho National Engineering Environmental Laboratory***

This course provides information to individuals interested in the HPS accreditation program, and is also part 2 of a 2-part course for certifying individuals to audit laboratories for HPS accreditationThe objective of this professional enrichment program topic is to familiarize HPS Laboratory Accreditation Program technical assessors and others with the requirements of the assessment program. The training will describe the program documentation, incorporated elements of ISO/IEC 17025, the accreditation process, and will specifically address technical requirements for instrument calibration and source manufacturing laboratories. The training is required for all members of the HPS Laboratory Accreditation Assessment Committee and is recommended for facilities interested in accreditation. The HPS program is similar to other ISO/IEC 17025 based accreditation programs and the training will be useful for anyone interested in the accreditation process.

2-F An Overview of PET/CT Fusion Imaging. ***C. Plott; Forsyth Medical Center***

Honored as the Time Magazine Medical Invention of the Year 2000, PET/CT scanners combine the metabolic imaging of PET and the anatomic imaging of CT. Fusing or combining these modalities yields a dynamic tool that may contribute significantly to patient care with regard to the assessment and management of disease.

The fundamental radiation safety issue at PET imaging facilities (as compared to conventional nuclear medicine imaging facilities) is the increased exposure rate due to the high energy of the associated annihilation radiation. The issue becomes even greater with increased patient dosages and increased patient throughput with CT-based attenuation correction and faster PET acquisition times. However, extreme "over-design" of the facility or procedures may lead to untenable engineering, cost, or time constraints.

This session will include an overview of PET/CT, including types of scanners, clinical applications, and basic imaging protocols. Practical suggestions and examples of facility design for reducing exposure to technologists, ancillary staff, and members of the general public will also be included.

2-G Operational Aspects of the Incident Command System (ICS) for the Health Physicist. ***G. Anastas, W.S. Field; Environmental Evaluation Group of New Mexico, New Mexico Office of Emergency Management***

No emergency response agency can handle a large-scale emergency alone. The Incident Command System (ICS) was developed to coordinate the efforts of different agencies working towards a common goal. Use of ICS has recently been formalized in Federal law with the adoption of the ICS-based National Incident Management System (NIMS).

The purpose of this course is to provide a working knowledge of ICS to Health Physicists who may respond to emergency situations involving radioactive materials. Radiation safety professionals need to understand how they may be expected to fit into the ICS organization, particularly in view of the work Chapter members are performing relating to the Homeland Defense Equipment Reuse (HDER) Program.

ICS is built around the use of common terminology, manageable span of control, integrated communications, unity of command, consolidated planning, designated incident facilities, comprehensive resource management, and a unified com-

mand structure. It also features a modular organizational structure that can easily expand or contract to meet the needs of any incident, regardless of size and complexity.

This course will provide an introduction to the concepts and principles of ICS, including scenarios and opportunities for attendees to apply what they have learned.

2-H Media Communications: Is Your Press Material Ready for an Emergency? *T. Sprackland; Freelance Journalist*

An experienced journalist will discuss guidelines and helpful tips that can be used when developing material for general distribution as well as press releases and working with a public information person. There will be laboratory time for evaluating your own existing material to identify weak sections, or working on a specific project. Ms. Sprackland is a freelance journalist with extensive experience in reporting on the energy and high tech industries. She also has worked in the public relations group for a state corporation commission, and for one of the first Internet-based trade news services. Currently, she represents United Press International (UPI) in Colorado, and is a contributor to Nikkei Electronics Asia and Small Times, a nanotechnology publication.

Sunday - 2:00 - 4:00 PM

3-A WMD Radiological/Nuclear Awareness Train-the-Trainer Course - Fast-Tracked. *J. DiLorenzo; U.S. Department of Energy (DOE) National Nuclear Security Administration Nevada Operations Office (NNSA/NV), Bechtel Nevada (BN/CTOS)*

(**NOTE:** TEPP training occurs in the AM, and both of those sessions are needed to become a certified WMD Awareness Instructor. A copy of prior TEPP Instructor Certificate is also acceptable.)

This DOE approved curriculum normally takes 6 hours for the classroom instruction, and another 6 hours for Train-the-Trainer coaching. This compressed instructional session is geared to empower Health Phycists to train their communities for WMD radiological/nuclear threat. Participants will receive high quality, reproducible training materials, including printable Adobe book files, Power Point slides, and supporting reference materials to efficiently educate their local audiences in Weapons of Mass Destruction Radiological/Nuclear Awareness. Adult education principles will be addressed, classroom management tools provided, along with best practice information.

This course is intended for Health Physics personnel who have attended the TEPP sessions prior in the day, and are responsible for the training of First Responders and Emergency Managers, including law enforcement agencies, fire departments, hazardous materials technicians, bomb squads, public health services, emergency medical service personnel, or other emergency management personnel. Those that successfully complete this session and have completed the DOE TEPP Train-the-Trainer sessions prior will be issued CD's for the WMD teaching materials.

3-B Operational Accelerator Health Physics. *S. Walker; Los Alamos National Laboratory*

This class will address general accelerator health physics. Accelerators offer unique and challenging problems for the Health Physicist. Newer and more powerful accelerators are constantly being developed. Monte Carlo codes and other tools are used to predict the outcome of high energy subatomic particles that are accelerated to very high energies. This course will give a broad overview of the various types of accelerators, such as electron, proton and spallation sources,

their uniqueness, and the special health physics challenges of working with accelerators. Specific topics to be addressed include accelerator interlock systems, proton accelerators, electron accelerators, spallation targets, ancillary X-ray hazards, prompt and residual radiation hazards, isotope production expectations, rules of thumb for dose expectation, radiation measurements, neutron hazards, dosimetry considerations, beam stop design, radiation measurements inside beam tunnels, and handling of high dose rate targets. The course is directed at the CHP but would also serve as an excellent basis for those studying for the CHP who wish to obtain an overview of accelerator health physics.

3-C Medical Internal Dose Calculations – A Practical Overview. ***M. Stabin; Vanderbilt University***

The recent emphasis on the use of nuclear medicine therapy agents against many forms of cancer has brought about an increase in the need for reliable and clinically meaningful internal dose calculations. Traditional mathematical model-based internal dose calculations are still in widespread use, for diagnostic and therapeutic agents, but trends are developing toward more patient-specific dose calculations. Calculation of internal dose estimates from animal or human data sets requires knowledge of a number of important principles and relationships, and knowledgeable use of available software tools. Adjustments to traditional dose calculations based on patient-specific measurements are routinely needed, especially in therapy calculations, for marrow activity (based on measured blood parameters), organ mass (based on volumes measured by ultrasound or Computed Tomography (CT)), and other variables. More data and resources are becoming available through the internet, and the power and speed of available tools is increasing rapidly. This program will give an overview of current tools and common practice in internal dose assessment in nuclear medicine, with practical examples worked out with the attendees in several important areas of application. A discussion will also be provided of the current status of the use of 3D, image fusion approaches for more detailed dosimetry in therapy.

3-D Radiation Quantities and Units: Their Evolution and Proper and Not Quite So Proper Usage and Applications. ***R. Kathren; Washington State University***

This PEP course examines the development of radiological quantities and units, showing how and why the current system of SI radiological quantities and units evolved and how the modern quantities and units relate and compare to their predecessors. Correct and proper application and usage of quantities and units, and interconversion from one system to another, will be stressed, and common errors, pitfalls, misuse, misapplication, and areas of abuse will be identified. The presentation should be of particular interest to persons involved in historical dose reconstruction, operational heath physics, epidemiology, and preparation of regulations and standards and is and primarily descriptive with a minimum of mathematical rigor. Topics considered will include the cgs and SI systems, quantities and units of activity, exposure-dose relationships, absorbed dose and kerma, dose equivalent quantities, and derivative and subsidiary quantities including DAC, ALI and WL.

3-E Aerosol Inhalation Lessons and Applications based on the ICRP 66 Lung Deposition Model. ***M. Hoover; CDC-National Institute for Occupational Safety and Health***

This PEP course illustrates practical aerosol science lessons and applications of the International Commission on Radiological Protection Publication 66 Human Respiratory Tract Model (HRTM) (ICRP 1994). Models including the LUDEP Personal Computer Program for Calculating Internal Doses using the ICRP Publication 66 Respiratory Tract Model will be used to illustrate the importance of knowing aerosol properties such as particle size and human subject properties such as breathing rate. Approaches for obtaining needed aerosols properties will be illustrated. Industrial hygiene examples will include respiratory tract deposition of beryllium and anthrax. The new HTRM is a general update of the Lung Model in ICRP Publication 30 (ICRP 1979) for adult workers, and is significantly broader in scope. It applies explicitly to workers and all members of the public, for (1) inhalation of particles, gases and vapors; (2) evaluation of dose (or material retention) in sensitive regions of the respiratory tract, for a given intake or exposure, and; (3) interpretation of bioassay data. The HTRM provides a physiologically realistic framework for modeling respiratory tract retention and excretion characteristics, and the resulting respiratory tract and systemic organ doses. It enables knowledge of the aerosol characteristics, dissolution and absorption behavior of specific materials to be used in a realistic manner, and calculates meaningful doses in relation to the morphological, physiological, and radiobiological characteristics of the various tissues of the respiratory tract.

3-F How to Deal with the Terror of Radiation and Nuclear Terrorism. ***R. Johnson; Radiation Safety Academy, Inc.***

Part I - Understanding the Fear Factor

First responders and specialists in radiation safety may find that the greatest challenge in response to nuclear terrorism is dealing with people's fears rather than technical issues. We may be well trained to deal with the technical aspects of a nuclear incident, but will we be prepared to deal with fears, terror, and risks that may confront our own families. Over 60 years of mostly negative press about radiation have created an almost universal mindset that radiation is bad and to be avoided at all costs. This mindset will result in most people (the public and first responders alike) to be instinctively afraid of radiation. Thus, radiation is an ideal choice for terrorists to use for creating terror. People will respond according to their mind set, their perceptions, and the images in their minds of the terrible consequences of radiation. Phobias may abound from fearful expectations of extreme consequences related to the question, "What if - - - - -?" The Myers Briggs Type Indicator is a useful source of insight into how our inferior function or "shadow" is the basis for dark premonitions and fears that arise in a crisis. Fears and images can also be identified by the question, "What's so bad about that?" The fearful images often have little to do with reality. Will Rogers said, "I've experienced a great many terrible things in my life, a few of which have actually happened."

Part II - Practical Tools for Effective Risk Communication

People are generally most afraid of what they know the least about. Recognizing that fear may be a greater driving force in people's reactions to a crisis than the technical circumstances will help us become better responders. Fearful people want their fears heard and respected. They

want to know if you care. Thus the axiom, "People don't care how much you know, until they know how much you care." The most effective risk communicator will be the one with the most tools available. For example, one important tool is to know your natural communication style (from Myers Briggs Type Indicator insights). Matching your style to the preferred style of others is your best chance for connecting. Another tool is to have a clearly set goal for evaluating the success of your communication. One of your tools should include how to identify and deal with fears. Another tool has to do with establishing your social role and deciding how to position your communication for success. You need to know the best tools for presenting your message and how to hear and evaluate feedback. The last tool is about troubleshooting and revising your message.

3-G The Quehanna Facility D&D Project and Lessons Learned. ***D. Allard, B. Werner, L. Penney, K. Kasper, M. Taylor; Pennsylvania Department of Environmental Protection, Scientech, Inc.***

The Pennsylvania Department of Environmental Protection (DEP) Bureau of Radiation Protection (BRP) has provided management and technical support to several other state agencies for the decommissioning and decontamination (D&D) of the Quehanna research reactor and hot cell facilities. The Quehanna facility D&D was an extremely challenging cleanup project, with numerous impediments to overcome and lessons learned. The federal government supported research programs at this facility for advanced jet engines and a nuclear powered aircraft. Since the 1960's, the facility had an interesting history of ownership, occupancy, and operations. In preparation for decommissioning, characterization began in the early 1990s and D&D activities began in 1998. The Quehanna project is now in its final phase, and has involved: removal of 2,000 Ci of Co-60 pellets and sources of unknown origin from two hot cells; underground tank and soil removal; decontamination and removal of the hot cell shielding and building structures; overhead hot cell containment construction; development and deployment of a $1 million advanced robot to dismantle the confined interior of hot cell 4; an emergency removal of 90,000 Ci of Co-60 by EPA; and, packaging and shipment of significant volumes of low-level radioactive waste. The final objective is to clean up the legacy Sr-90 radioactive material contamination at the Quehanna facility to "unrestricted release" levels so the license can be terminated and buildings safely dismantled. Total cleanup costs to date are in the tens of millions of dollars. This work reviews a very complicated D&D project, the obstacles that were dealt with, and provides several key lessons learned.

3-H Security 101 for Radiation Safety Professionals. ***R. Emery; University of Texas Health Science Center***

In recent years, many safety programs have been involved in organizational re-alignments, shifting from a series of stand-alone units, to assimilation into comprehensive environmental health & safety or risk management programs. Such shifts compelled incumbents to expand their professional knowledge base to better understand the roles of their new organizational colleagues. The tragic events of 9/11 have served as an additional catalyst for change in this area. Issues related to security have become a major concern for employees and management alike. The traditional lines that separated security functions and safety functions have become blurred. Workplace evaluations that previously considered the possible safety and health implications of benevolent individuals are now are expected to include consideration of actions with sinister intent as well.

In recognition of this trend, it is imperative that practicing radiation safety professionals become familiar with the security profession to ensure that issues are effectively addressed within the context of this new paradigm. Subsets of the radiation safety community involved with high risk operations such as weapons production and power generation have historically been attuned to security issues. But the involvement of others, such as those serving research, service, and educational settings, has been limited essentially to source security in response to notable personnel contamination events. This course will provide an overview of the security profession from the radiation safety program perspective, specifically addressing: (1) the philosophical differences between safety & security and security & public safety (police); (2) the areas where radiation safety and security intersect, especially post 9/11; (3) areas of possible cooperation, optimization and synergy; (4) the professional organization that represents the security industry and the associated professional certification in the field; and (5) the most useful references used in the profession.

The course will conclude with a review of the reported crime events involving sources of radiation in Texas over the past 45 years. Ample time will be allotted for questions, answers and discussion.

Monday - 12:15 - 2:15 PM

M-1 Treating Patients with Radioiodine: Clinical, Regulatory and Management Aspects. ***R. Reiman; Duke University Medical Center***

Thousands of patients are treated annually in the United States with iodine-131 for various medical conditions. Health physicists and radiological protection technologists who work in medical settings can expect to be involved in these therapeutic procedures. The objectives of this course are as follows: first, to introduce participants to the epidemiological and clinical aspects of medical conditions that are treated with radioiodine, including hyperthyroidism and thyroid cancer; second, to review the regulatory considerations under 10 CFR 35.75 and 10 CFR 20 regarding both inpatient and outpatient radioiodine procedures; and third, to see how the regulatory requirements are managed in a large medical center. Particular attention will be paid to addressing the concerns of patients, their families and hospital nursing staff. Web-based methods to facilitate documentation of outpatient treatment and other aspects of medical program management will be discussed.

M-2 Experts Witnesses and Radiation Litigation. ***R. Johnson, L. McKay; Schmeltzer, Aptaker & Shepard, PC***

Health physicists and radiation professionals involved in consulting, particularly those who appear as expert witnesses in litigation, must apply rigorous, and well-accepted scientific methods to often novel situations. The work and opinions of expert witnesses must withstand the scrutiny of their peers, and meet myriad legal criteria. Expert witnesses must present their complex work and opinions in a way that jury of lay people can understand, so that they can make determinations about technical aspects a case.

This course identifies various roles that health physicists and radiation professionals play in radiation litigation, including implementing field studies, performing dose assessments, preparing recommendations regarding site use and remediation, analyzing dosimetric data, and interpreting the positions of various scientific bodies. Course participants will learn the relevant professional, scientific, and legal standards applicable to these tasks. The course reviews common challenges and unique problems associated with conducting relatively routine professional tasks in a litigation setting. To aid

understanding of performing health physics jobs in a litigation setting, the course includes an explanation of the types of claims that are typically made in litigation involving injuries associated with radioactive materials, and the requisite proof for those claims. The course gives examples of effective ways to convey complex technical information and analyses so that it can be understood by attorneys, judges, and jurors who, in most cases, lack substantial knowledge of radiation and health physics concepts.

Finally, the course uses describes the work of radiation expert witnesses in a number of cases, and invites the audience to examine this work in the context of the technical and legal requirements that apply to such work.

M-3 A Need for Paradigm Shifts in Radiation Biology? Recent Low Dose Studies Say "Yes." ***A. Brooks; Washington State University Tri-Cities***

The development of modern molecular biology and equipment such as microbeams has made it possible to study responses of cells following exposure to low and non-uniform radiation energy distributions that were not possible in the past. Such studies have suggested four major areas where paradigm shifts may be needed. First, cells exposed to very low doses of radiation have unique changes in gene expression compared to cells exposed at higher doses. These low dose radiation-induced changes result in dose-dependent physiological alterations that are expressed at the time of exposure as well as at later times. Second, the early responses modify the sensitivity of the cells and have been termed "adaptive" responses. Third, later responses have been shown to result in a loss of "genomic stability" which questions the classical paradigms about how mutations and gene expression interact with promotion, cell differentiation, cell division and apoptosis to produce cancer. Finally, modern techniques also been demonstrated that it is not necessary to deposit energy in the cells to create these biological responses. These changes have been called "bystander effects" which suggests that the "hit" theory paradigm may need to be reevaluated in terms of much larger targets. The relationships among these four phenomena have been modeled based on cellular systems and depending on the models selected can result in very different dose-response relationships. Such studies suggest that linear extrapolation from responses at high doses to those at low doses may not be appropriate. The data presented here demonstrates that these phenomena are inter-related and that the outcome in animals or humans will depend on which response is dominant in any organ, tissue or animal system. Research Supported by the Office of Biological and Environmental Research U.S. Department of Energy through a grant No. DE-FG03-99ER62787 to Washington State University Tri-Cities.

M-4 Calculating and Reporting Fetal Radiation Exposure from Medical Procedures. ***A. Karam; Rochester Institute of Technology***

On occasion, pregnant women receive diagnostic medical procedures using radiation or radioactivity. This may occur because they are unconscious from trauma and are not visibly pregnant or because they discover their pregnancy after the procedures. In such cases, medical health physicists should be called upon to calculate a fetal radiation dose and to report this to the woman's physicians. However, dose information alone is not sufficient because many physicians are not familiar with the fetal effects of ionizing radiation. It is essential to present supporting information to the woman's obstetrician so both doctor and patient can make a reasonable decision based on facts and

not on fears. It is also important to remember that, as health physicists, we cannot make medical recommendations; we can only calculate the dose and provide references to the medical literature.

This PEP will discuss some standard methodologies for calculating fetal radiation exposure, the current medical guidelines based on the exposure and gestational age, and how this information can be presented. In addition, some legal aspects of these reports will be discussed.

M-5 Radiation Epidemiology for the Health Physicist. ***J. Boice, Jr.; International Epidemiology Institute and Vanderbilt University Medical Center***

Epidemiology from a radiation perspective will be presented with kaleidoscope coverage of past and present studies of interest to the health physicist. Epidemiology is the study of the distribution and determinants of disease in human populations; but not all studies are equal. Experimental studies (clinical trials) and cohort studies (e.g., atomic bomb survivors) identify individuals with and without exposure and then follow them forward in time to determine cancer outcome. Case-control studies (e.g., prenatal x-ray, indoor radon) identify persons with and without the disease of interest, and then prior radiation exposures are determined and compared. Ecological studies (e.g., cancer risk living near nuclear facilities) compare cancer rates of populations living in geographically defined areas with potential for exposure to cancer rates in populations living in other areas with supposedly lower exposure potential. Actual exposure to individuals, however, is unknown in geographical correlation studies. Epidemiology is an observational science (non-experimental) and is thus susceptible to confounding factors (e.g., smoking) and biasing factors (e.g., differential recall) that can distort study results. Cohort studies are the least susceptible to biases and ecological studies the most. Strengths and limitations of specific radiation studies will be discussed.

Tuesday - 12:15 - 2:15 PM

T-1 Mixed Waste Management at a Large Academic University/Medical Institution. ***M. Zittle; University of California - Los Angeles***

Mixed Waste contains both Radiological and Hazardous / Toxic constituents and is subject to complex regulations and legal requirements making storage, treatment, transportation, and disposal difficult and expensive. Management of mixed waste at academic and medical institutions can be especially difficult because of the small quantities and wide varieties of wastes generated. Because these organizations are often non-profit or government funded, it is important to keep costs down while maintaining regulatory compliance. Although often perceived as difficult, it is possible to be in compliance with all Federal and State EPA and NRC regulations without going over budget.

This PEP will focus on effective mixed waste management techniques at Large Academic Universities and Medical Institutions. An overview of the many regulations and enforcement agencies will be presented, focusing on the newly enacted EPA Conditional Exemption for the Storage, Treatment, Transportation, and Disposal of Mixed Wastes. Sorting and segregation schemes for managing mixed waste will be presented and discussed. This PEP will emphasize the importance of utilizing careful analysis and process knowledge to efficiently manage mixed waste. Training of mixed waste generators is perhaps the most effective means of managing mixed waste. Creative ideas will be presented that allow waste managers at academic and medical institutions to effectively train waste generators and reduce the cost of mixed waste disposal at the same time.

T-2 Critical Decisions for First-Time and Experienced Managers (or How I Learned to Love the Org Chart). ***J. Hylko; WESKEM, LLC***

Following graduation from a health physics program or related technical field, an individual's training and career development activities typically focus on acquiring additional work experience and enhancing technical problem-solving skills. However, as health physicists advance throughout their careers, managerial duties, such as supervising employees and overseeing projects, result either through professional advancement or staffing changes within a company. Therefore, as health physicists gain additional experience and years in the profession, they may be required to accept and adapt to the role of a manager. This new role typically requires supervising, guiding and influencing the direction of a department and its employees. Having worked for a variety of managers throughout his career and now supervising an Environmental, Safety and Health (ES&H) Department across three separate projects, the instructor presents first-hand experiences related to the successes and pitfalls serving as a department manager. Discussion topics and real-life examples will cover defining roles and responsibilities, motivation, communication, reasons for effective leadership, supporting employees during a crisis, as well as allocating resources and budgets. In addition, enhancing your own department's productivity can be achieved with support from other internal organizations (e.g., quality assurance and human resources). Both aspiring and experienced managers will acquire useful information that can be applied immediately in their current work location.

T-3 Radiopharmaceuticals: Update on New Diagnostic and Therapeutic Agents. ***D. Fisher; Pacific Northwest National Laboratory***

Advances in the nuclear medicine sciences have improved our ability to detect and treat cancer, diagnosis neurological conditions, evaluate heart conditions, and relieve pain. Rapid advances in 18FDG-PET and PET combined with CT provide the ability to image both structure and function—and thus have improved our ability to detect cancer, assess disease spread, and evaluate appropriate treatments. Substantial progress has been made in developing new approaches to cancer therapy using radiolabeled monoclonal antibodies. Alpha-emitting radionuclides have been used successfully in experimental cancer therapy and for treating painful skeletal metastases, and show outstanding future promise. The growth in high-dose radionuclide therapy will continue as clinical trials are successful and new products are approved by the FDA for general use. These and other developments in radiopharmaceutical science will be described.

T-4 NRC and EPA Guidance on Remediation of Radioactively Contaminated Sites. ***D. Kocher; SENES Oak Ridge, Inc.***

For the last several years, the NRC and EPA have been engaged in a dispute over the adequacy of NRC regulations for remediation and license termination at radioactively contaminated sites in the license termination rule (10 CFR Part 20, Subpart E). Those regulations apply, for example, at nuclear power plants and licensed uranium enrichment and fuel fabrication facilities. At issue is whether NRC's dose criteria, principally a limit on annual effective dose equivalent to a member of the public of 0.25 mSv, are consistent with criteria established by EPA under CERCLA in the National Contingency Plan (40 CFR Part 300). EPA regulations

establish goals of limiting lifetime cancer risks to about 10-4 and limiting concentrations of contaminants in groundwater and surface water resources in accordance with federal drinking water standards. The ongoing dispute, which was not resolved by a recent Memorandum of Understanding between the two agencies, is important because EPA could intervene under CERCLA in decisions by NRC to terminate licenses if EPA judges that public health and the environment would not be adequately protected. This presentation discusses NRC and EPA guidance on remediation of radioactively contaminated sites at several levels including (1) governing laws and organizational structures and functions, (2) applicable regulations, including NRC regulations in 10 CFR Part 40, Appendix A, that apply at thorium mills and uranium extraction facilities and are based on EPA regulations in 40 CFR Part 192, and guidance to interpret the regulations, and (3) methods of site characterization and dose or risk assessment used to demonstrate compliance with regulatory criteria. Approaches to practical decision making at specific sites, including involvement by the public and other stakeholders, and the vital role of the states in decisions about remediation of contaminated sites also are discussed. The central theme of this presentation is the essential equivalence of NRC and EPA regulations and guidance in protecting public health and the environment at contaminated sites when the importance of the ALARA requirement in NRC regulations and the various balancing and modifying criteria in EPA regulations and the importance of uncertainties in site characterization and methods of dose or risk assessment are taken into account. Steps that might be taken to harmonize NRC and EPA guidance and approaches to decision making at specific sites are considered. This presentation is based largely on a recent study by NCRP Scientific Committee 87-5, but many of the views expressed do not necessarily represent the views of the committee or the NCRP.

T-5 Instrumentation Selection and Common Issues in Radiological Emergency Response Preparedness and Deployment. ***C. Riland; Remote Sensing Laboratory – Bechtel Nevada***

The much of instrumentation used for emergency is the same used for everyday Health Physics activities. The major difference is the circumstances under which the instruments are used. Health Physics instrumentation needs for emergency response operations can vary greatly with the arrival time, the unique situation and the mission of responding elements. Determination of appropriate instrumentation requires assessment of several factors, including; the skill level of instrument users, conditions of instrument use (radiation levels, environmental conditions, etc), storage and transport of instruments, and costs.

Also included is a presentation of observations from numerous exercises and events over recent years. Common problem areas and issues are pulled from After Action Reports, Lessons Learned, and personal experiences. Information is presented based upon several different scenarios, including; Terrorist Events, Nuclear Power Plant Events, Nuclear Facility events, and Weapons Events. Issues presented represent views from the perspective of participant, observer, controller, and evaluator. Problem areas discussed include deployment and logistics issues, instrumentation, sample collection and analysis, responder and public protection, data assessment and distribution, management issues, and preparation. Presentation is meant to stimulate thoughts and discussion for problem areas that are well known and also those that are less obvious.

*(Work supported by the Department of Energy under Contract DE-AC08-96NV11718)

T-6 U.S. Environmental Protection Agency's Risk Assessment Methodology for Radioactive Contaminants. ***A. Fellman; Radiation Safety Academy, Inc.***

Under the Superfund law, the U.S. Environmental Protection Agency (EPA) must establish the existence of an unacceptable risk to human health and/or the environment prior to authorizing the expenditure of resources for site remediation. Absent such a risk, a site is ineligible for cleanup under the Superfund remedial program.

EPA has published several Risk Assessment Guidance (RAGs) documents which detail the approved methodology for performing quantitative risk assessments at Superfund sites. This PEP session will consist of a review of the major elements of a risk assessment as described in the RAGs methodology, including identification of radionuclides of concern, determination of exposure point concentrations, and analysis of environmental pathways, future use scenarios, and exposure pathways. The various sources of uncertainty will also be discussed. The basis of EPA's approach to risk assessment will be described and debated.

Students should bring a calculator to this PEP session. Time permitting, students may be asked to work in groups on a sample problem to evaluate the magnitude of risk posed by radionuclide contamination of soil and groundwater. Otherwise, the sample exercise and solution equations and table will be distributed as a handout.

Wednesday - 12:15 - 2:15 PM

W-1 The Effects of Nuclear Weapons and Radiological Dispersive Devices. ***J. Alvarez; Auxier & Associates, Inc.***

Policy and planning for terrorist attacks using nuclear weapons or explosively dispersed radiological sources requires knowledge of the effects of these devices. The likely scenario for responding to an attack includes the blast damage and casualties and the radiological casualties and associated hazard of the contamination zone.

The effects of nuclear weapons has been known since the bombings of Hiroshima and Nagasaki and the above ground nuclear tests designed to study yields and effects. These effects depend upon the size of the weapon (explosive yield) and the location of the weapon in relation to the surface of the earth (surface or air burst). Casualties and the treatment and rescue of survivors will depend upon distance from the center of the detonation.

Explosive dispersal of radiological sources is similar in many ways to a nuclear device, except size. Casualties and the treatment and rescue of survivors will depend upon distance from the center of the detonation. Explosive dispersal is not as easy as it may sound or be claimed. Predicting the dispersion of the radioactivity for planning depends upon predicting the ingenuity of the design. The most likely guess is that explosives would not be used for dispersal of a very large (greater than a few curies?) source, but that radioactivity might be added to a large explosive for confusion and confounding.

Interdiction should be stressed as prevention instead of cure. Detection of radioactive sources of sizes that would introduce considerable confounding is relatively easy.

W-2 Ethical Conduct of Human Subjects Research for the Health Physicist. ***L. Coronado; National Institutes of Health***

What makes clinical research ethical? What is the difference between clinical care versus clinical research? What regulations, principles, and guidelines apply to human subject research? What defines research? Who is a research subject? Who are considered vulnerable

populations that require extra protections? What are these extra protections? What criteria are used in assessing the risk and benefits of a clinical study? How about when the study involves ionizing radiation administered solely for research purposes and not for the prospect of direct benefit of the subject? What are the considerations in exposing healthy individuals to ionizing radiation for research objectives? Are there any dose limits? What constitutes true informed consent? What is the purpose and function of the Institutional Review Boards (IRBs)? What role does the Health Physicist (HP), the Radiation Safety Officer (RSO), the Radioactive Drug Research Committee (RDRC) and Radiation Safety Committee (RSC) play in the arena of clinical research? This PEP course will provide an overview of the historical perspectives, regulatory framework and current challenges of clinical research, tailored for the Health Physicist.

W-3 Managing and Auditing University Radiation Safety Programs. ***A. Karam; Rochester Institute of Technology***

University radiation safety programs can be complex, combining large numbers of researchers and radiation workers working with radioactive materials in a variety of settings, as well as research irradiators, check sources, radioactive stock vials, and the administration of radioactive materials to either human or animal subjects. This wide variety of uses presents a number of administrative and technical challenges that can make a broadscope license much more difficult to administer, as well as much more interesting. In addition, working with university administrators and researchers who are not always attentive to good radiation safety work practices can lead to other challenges, as well as high antacid bills.

An essential part of any radiation safety program is making sure that good radiological work practices are being followed. This includes performing periodic laboratory inspections. These inspections help remind the researchers of the requirements to follow regulations and they help Radiation Safety feel comfortable that researchers are following regulatory and institution requirements and policies. If problems are found, these inspections can also serve as the basis for corrective or disciplinary actions and can help reassure regulators that the institution is dedicated to adhering to proper radiation safety practices.

In this PEP, we will review some of the requirements of maintaining and administering a university radioactive materials license. We will discuss methods of working with researchers in a non-dictatorial manner to help them understand the necessity of following proper radiation safety procedures (although, let's face it, there will always be "problem children"), as well as how to work with your regulators in a non-adversarial manner.

W-4 Conducting a Comprehensive Laser Safety Hazard Evaluation in the Research University Setting. ***B. Edwards; Duke University***

Entering an accomplished research scientist's laboratory to conduct a laser safety audit can present an overwhelmingly complex and intimidating task. Adopting a methodical approach ensures that every aspect of the lab's laser safety program receives a thorough review, in a manner that conveys professionalism and establishes credibility. Employing a standardized evaluation process also improves consistency, reducing the probability that a deficiency noted in one lab gets overlooked in the audit of the adjacent lab. Finally, a systematic approach to laser hazard analysis offers the most effective and efficient means to identify, and thereby

create the opportunity to correct, potentially unsafe working environments.

This course provides a step-by-step approach for conducting a rigorous hazard evaluation of a research university laboratory containing class 3b and 4 lasers. This method provides a concise distillation of the requirements in the ANSI Z136.1-2000 and ANSI Z136.5-2000 standards for the safe use of lasers. Course attendees will learn a flexible yet rigorous procedure to efficiently prepare for, conduct, and document a useful, professional laser safety hazard evaluation. This method can expand to accommodate an arbitrary number of lasers and adapt to a wide range of experimental set ups.

While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser safety responsibilities will benefit from this course. Although basic laser hazard calculations are outside of this course's scope, participants should bring a scientific calculator to allow a "walk through" of example pre-worked hazard calculations. Students will also find their own copy of ANSI Z136.1-2000 a helpful reference.

W-5 Radiation Emergency Response - Legal Considerations. ***L. McKay; Schmeltzer, Aptaker & Shepard, PC***

Federal, state and local radiation protection authorities responsible for developing, and implementing emergency response plans in the event of a radiological terrorist incident or accident must take account of recent legislation and Executive Orders addressing the roles of various agencies in such events. This course will review the laws and rules governing responses to mass accidents and events. The course will also address the basis for the responsibilities of, and relationships between federal, state and local authorities who may respond to a radiological emergency. Finally, the course will identify legal liability considerations for planning and responding to radiological emergencies.

Continuing Education Lectures
Included with Registration

Monday - 7:00- 8:00 AM

CEL-1 Terrorism: One Pediatrician's Perspective. ***R. Brent; duPont Hospital for Children, Nemours Foundation, Thomas Jefferson University***

The Health Physics Society (HPS) is one of a few scientific Societies that do have a membership that is knowledgeable about one area of terrorism. But, 'we need a multitude of experts to solve the problem of terrorism in the 21st Century.

I first expressed my concern about terrorism in a 1972 letter to "Pediatrics". I stated my concern about the fact that the United States was stopping the vaccination of their population, in spite of the fact that the Russians and Chinese were continuing to vaccinate theirs. My concern was that we had not considered all the consequences of this decision. In 2002 "Pediatrics" republished my letter with the title "A voice from the past".

All techniques of terrorist attacks will be discussed, namely: 1) Biological, 2) Chemical, 3) Physical and 4) Radiation terrorism. Rather than react to the attacks, the highest priority is to prevent terrorism, not develop appropriate methods to react and decrease the impact of these attacks. We must realize that:

1) We are in a world war that is different than any other war that the world has faced.

2) While it may appear that the terrorist's main purpose is to create death and destruction, it is not. Their main purpose is to create economic chaos and panic.

3) Although we are at war, a large proportion of the world's population is not willing to face this reality or make any sacrifices that nations have done in the past when faced with a dangerous enemy.

4) There are many clever and important options that have not been incorporated into our plans to prevent terrorism.

What ideas do you have to counteract terrorism that have not been suggested or have not been incorporated into our National programs?

CEL-2 Radiation Protection ANSI Standards and the Health Physics Society. ***J. Ring; Harvard University***

This presentation will review the development of standards within the HPS and the roles of the various organizations in setting these standards, opportunities for HPS members and a summary of current activities of ANSI N13. The HPS has a long history of standards involvement and is the sponsor of two American National Standard Institute (ANSI) Accredited Committees N13 and N43 and gives these standards to members as a membership benefit. The process of producing in ANSI standard must meet a variety of specific conditions to ensure that individuals and organizations with interest in a particular standard can agree to its content. The HPS ensures these requirements are met through the Standards Committee (HPSSC), the Secretariat and member involvement. A completed ANSI standard requires countless hours by many volunteers of varying backgrounds, to winds its way from concept to an accepted ANSI/HPS standard.

Historically, these standards were used to demonstrate regulatory compliance or to ensure an acceptable level of performance. With the passage of the National Technology Transfer and Advancement Act of 2000 and OMB Circular A-119, governmental agencies are looking for consensus standards such as those produced by the HPS as an alternative to setting their own requirements. With these changes in government requirements, timely and pertinent radiation protection standards are more important than ever and require participation by knowledgeable people in the

development, review and approval of a standard. As a result, there is more need and opportunities for member involvement in the standards development process.

Tuesday - 7:15 - 8:15 AM

CEL-3 Physics, Health Physics, and Applications of Backscatter X-Ray Imaging. ***D. Strom; Pacific Northwest National Laboratory***

The presentation will cover how x-ray backscatter works (reflection as opposed to transmission), the physics of Compton backscatter, what the physics tells about which atomic numbers are preferentially imaged, as well as effects of densities and thickness. I will discuss what kinds of x-ray generators (x-ray tube vs. linac) and power supplies are used, the accelerating potential and beam current. I will present the x-ray spectra of incident beams, tradeoffs between penetration and backscatter optimization, and detector capabilities; ideal and practical spectra of scattered beams. Tradeoffs related to beam size, shape, filtration, and collimation are presented. The duration and patterns of exposure scan are described. Shielding and collimation of the x-ray generator, and image receptors are addressed. Doses to containers, cargo, operators and nearby members of the public are given for cargo scanning systems, as well as "dose" (numbers of photons) needed at the image receptor. The dose values are placed in perspective in terms of risks, benefits, frequency of exposure, and ISO 14001 considerations. Operational radiation protection is outlined. Image considerations, such as types of image receptors, image resolution, image processing, electronics, and image storage and retrieval are presented, along with the ancillary use of image receptors to detect radioactive sources. I will present applications of backscatter x-ray technology to homeland security, alone and in conjunction with single or multi-energy transmission radiography equipment in the detection of explosives, contraband, and weapons for both cargo and people. I will list advantages and limitations, privacy issues, and future developments.

*Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle under Contract DE-AC06-76RLO 1830.

CEL-4 High Dose Irradiation of Mail and Products. ***O. Suleiman, E.A. Tupin; US Food and Drug Administration, US Environmental Protection Agency***

The anthrax-laden letters sent through the U.S. Postal system in late 2001, which led to the deaths of two U.S. Postal Service workers, caused the Postal Service to look for way to kill anthrax spores in the mail. High dose radiation was the method chosen. The initial dose selected as necessary to kill or inactivate anthrax spores was 56 kGy. Similar doses are used to irradiate medical products for the purpose of sterilization before use in patient care. In both of these applications, large volumes of bulky, non-uniform material must be irradiated to achieve a minimum dose, sufficient to reach the desired kill potential, yet not exceed the dose at which there might be issues from destruction of the material. Delivery of doses at the level necessary and to the volume of material in the U.S. mail or in medical device product streams requires large irradiation facilities and the ability to deliver these large doses in a short time. Dosimetry to validate the dose delivery, showing that the doses are within the agreed to parameters is different from dosimetry found in other applications.

Wednesday - 7:00 - 8:00 AM

CEL-5 Outpatient Release of Nuclear Medicine Patients: Health Physics Aspects. ***J.A. Siegel, M.G. Stabin; Nuclear Physics Enterprises, Vanderbilt University***

The medical use of radioactive materials is governed by the Nuclear Regulatory Commission (NRC) and the various Agreement States. NRC regulations, specifically 10 CFR 35.75, permit the release of patients administered radioactive materials using dose-based criteria. These criteria provide a more meaningful basis for patient release than activity-based or dose rate-based limits; therefore, licensees can best demonstrate compliance by performing patient-specific dose calculations. The methodology to estimate dose to others likely to be exposed to released patients, as provided in NRC guidance documents as well as peer-reviewed scientific literature, will be critically reviewed and the resulting dose estimates will be compared to actual measurements of family members exposed to released patients. In addition to the dose calculations, it is important that the dose to others be maintained ALARA and appropriate procedures for addressing this consideration (e.g., patient interviews and issuance of appropriate radiation safety instructions) will be discussed. Lastly, issues involving patient release and the placement of radiation detectors at landfills and more recently, in public transportation and other infrastructures, will be presented.

CEL-6 Radiation Health Effects in Atomic Bomb Survivors: A Review of Recent Results. ***D. Preston; Radiation Effects Research Foundation***

Sixty years after the bombing of Hiroshima and Nagasaki our understanding of the nature and extent of the long term effects of radiation exposure on the health of the survivors continues to evolve and interesting new findings are emerging. The past few years have seen the publication of major reports and cancer and non-cancer risks in the survivors and their children. This lecture will review the results of these studies with a particular emphasis on issues related to the shape of the dose response, and the description and interpretation of temporal patterns and gender effects on the radiation-associated excess risk. Other topics to be discussed include the nature and likely impact of recent changes in survivor dose estimates and new data on radiation effects among those exposed in-utero.

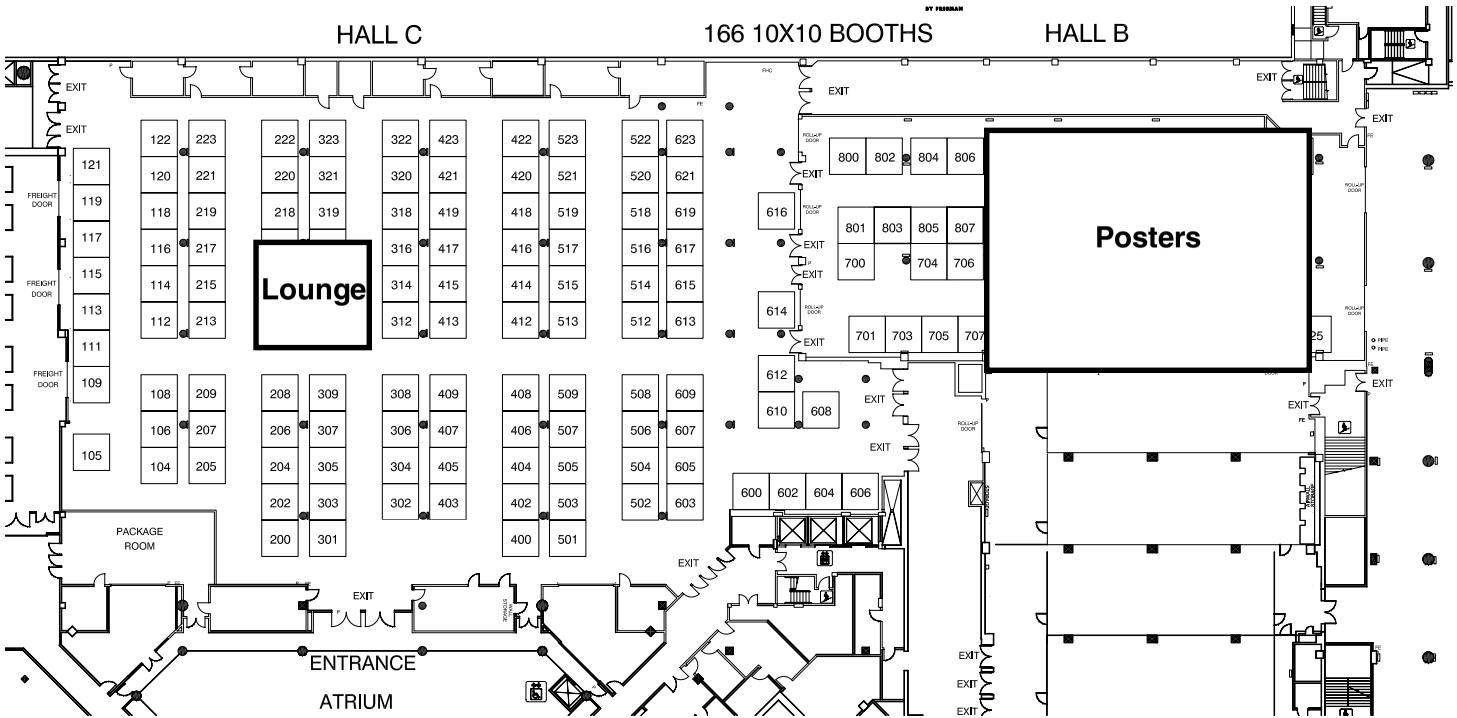
Thursday - 7:15 - 8:15 AM

CEL-7 Radioactive Cure-alls. ***P. Frame; Oak Ridge Associated Universities***

No sooner had radioactivity been discovered than it was being touted as a cure for everything from depression to cancer. More than a century has now gone by, but similar claims are still being made, and they are made around the world: from North America to South America to Europe and Asia. This presentation, something of a quack-cure show-and-tell, will chronicle the history of these claims.

CEL-8 Current Issues in Radiation Epidemiology. ***J. Boice, Jr.; International Epidemiology Institute, Vanderbilt University Medical Center***

Although radiation studies have been conducted for nearly 100 years, there are still scientific and societal issues that keep radiation epidemiologist employed. What reduction in risk, if any, follows prolonged exposures? Will worker studies provide answers? Have the Chernobyl and Techa River studies revealed new insights? Do low doses cause noncancers? Is the pooling of indoor radon studies of value? What new studies should be initiated today if resources were available


HALL C
166 10X10 BOOTHS
HALL B
Lounge
Posters
PACKAGE ROOM
ENTRANCE
ATRIUM
EXIT
FREIGHT DOOR

2004 Exhibitors

2005 ANNUAL MEETING Booth: 803

2005 MIDYEAR MEETING Booth: 805

AAHP/ABHP Booth: 801

ADCO SERVICES Booth: 118
Adco Services, Inc. handles the brokering for processing and disposal of radioactive, hazardous, and non-hazardous wastes.

ADVANCED TECHNOLOGIES & LABORATORIES INTERNATIONAL INC. (ATL) Booth: 610
ATL's radioanalytical laboratory is available to support your project needs. Our highly qualified and professional staff includes certified physicists, radiochemists, laboratory and field technicians, and experienced project managers.

AEA TECHNOLOGLY QSA, INC. Booths: 119 121
AEA Technology QSA, Inc. is the worlds largest manufacturer of reference sources and solutions for instrument calibration and environmental monitoring. Isotrak is proud to introduce a new line of portal monitor calibration sources for Homeland Security applications in compliance with the new ANSI N42.35 standard.

ALPHA SPECTRA, INC. Booth: 223
Alpha Spectra, Inc. manufactures gamma-ray detectors for health physics, academic, industrial, medical and exploration applications. Scintillation materials used include most of the common phosphors e.g. NaI(T1), BGO, plastic, etc.

AMERICAN NUCLEAR SOCIETY Booth: 523
The American Nuclear Society publishes Nuclear News, Radwaste Solutions, technical journals, standards and position statements. Its 11,000 members represent to the government and the public a unified voice in support of nuclear science and technology.

ANALYTICS, INC. Booth: 514
Supplier of NIST-traceable radioactivity standards for the calibration of alpha, beta, and gamma-ray detectors. Provider of performance evaluation samples for effluent and environmental monitoring programs.

BERKELEY NUCLEONICS CORP. Booth: 307
Founded in 1963, BNC is an internationally recognized pioneer in the development of precision test and measurement instrumentation and real-time radiation detection, surveillance and measurement equipment. BNC'S line of products includes pulse, digital delay and light pulse generators, nuclear radiation meters and SAM 935 real-time radiation surveillance and measurement system.

BERTHOLD TECHNOLOGIES Booth: 222

BIONOMICS, INC. Booth: 104
Radioactive and Mixed Waste Pick Up and Disposal Services.

CANBERRA Booths: 412, 414, 416, 418, 513, 515, 517, 519
Canberra is the world's leading supplier of analytical instruments, systems and services for radiation measurement. Applications for Canberra offerings include health physics, nuclear power operations, Radiation Monitoring Systems (RMS), nuclear safeguards, nuclear waste management, environmental radio-chemistry and other areas.

The new Canberra has the broadest array of Health Physics capabilities in the industry. HP related products include

a full range of gamma and alpha spectroscopy equipment, personnel contamination monitors, hand held survey instruments for alpha, beta, gamma and neutron measurement, whole body counters and area monitors. The company also offers a full range of services including repair and maintenance, training and expert data review.

CARDINAL HEALTH Booths: 213, 215
Victoreen, Nuclear Associates and Global Calibration Laboratory are all included in the Syncor Radiation Management Organization and are committed to continue to design, manufacture and distribute electronic instrumentation for the detection and measurement of ionizing radiation. Survey meters include alpha, beta, gamma and neutron along with Area and Process monitors and the popular Universal Digital Ratemeter for nuclear power and environmental monitoring. Featured new products include the colorful Model 451 series of ion chambers with Excel software application. The new Model 990 will be introduced at this show. The Global Calibration Laboratory offers an industry-first 24X7 same day turnaround.

CHASE ENVIRONMENTAL GROUP INC Booth: 209
Radioactive and mixed waste brokerage, processing and disposal. Radioactive and chemical hazard remediation and decomissioning. Sealed source recovery/recycle service available.

CORIXA CORPORATION Booth: 600
Corixa is a developer of immuno-therapeutics with a commitment to treating and preventing autoimmune diseases, cancer and infectious diseases by understanding and directing the immune system. Please visit our exhbit booth.

DADE MOELLER & ASSOCIATES Booth: 221
Dade Moeller & Associates is a small business specializing in occupational and environmental sciences, with a focus on radiaiton protection and health physics.

DURATEK Booths: 217
Duratek solves waste management and environmental challenges facing today's commercial nuclear organizations. We provide clients comprehensive, cost effective services on a project, plant/ facility and fleet basis.

EASTERN TECHNOLOGIES/OREX Booth: 116
Eastern Technologies/OREX supplies OREX protective clothing and services in addition to traditional protective clothing supply and services.

ECOLOGY SERVICES, INC. Booth: 113
Ecology Services, Inc. provides a variety of health physics services and front-end support to waste generators including waste characterization, tracking, packaging and shipment preparation. We support the requirements of both large and small generators.

F&J SPECIALTY PRODUCTS, INC. Booths: 206, 208
IS0 9001 registered manufacturer of air sampling systems, airflow calibrators, radioiodine collection cartridges, filter holders, tritium collection systems, filter paper, radon detection products and more.

femto-TECH, INC. Booth: 105
Tritium in air monitors and systems and radon in air monitors.

FRHAM SAFETY PRODUCTS INC. **Booth: 202**

Frham is a leading supplier of Nuclear and Industrial safety equipment that offers decon supplies, innovative radiation and contamination protection, Health Physics supplies, rad-waste reduction items and custom manufacturing.

GAMMA PRODUCTS, INC. **Booth: 207**

The New Mini T - No gas required alpha/beta counting system.

GLAXOSMITHKLINE **Booth: 600**

GlaxoSmithKline is one of the world's leading research-based pharmaceutical companies with a powerful combination of skills to discover and deliver innovative medicines.

GLOBAL DOSIMETRY SOLUTIONS, INC **Booths: 302, 304, 403, 405**

Global Dosimetry Solutions, Inc. offers a wide range of services for measuring ionizing radiation. GDS utilizes film, thermoluminescent, and track etch technologies. GDS is accredited by NVLAP in the US and is an approved dosimetry service in Canada and the UK.

HEALTH PHYSICS INSTRUMENTS **Booth: 421**

Health Physics Instruments manufactures instruments and devices that measure gamma, neutron, beta, and alpha radiation. The line includes portable Geiger-counters through sophisticated fixed monitors, Rem meters, and multichannel analyzers. HPI has been serving the Health Physics community for over 30 years.

HEALTH PHYSICS SOCIETY PUBLICATIONS **Registration Area**

HI-Q ENVIRONMENTAL PRODUCTS CO. **Booth: 512**

Hi-Q Environmental Products Company has been a leading Manufacturer of Air Sampling Equipment, Systems & Accessories since 1973. Our product line includes: Continuous duty high & low volume air samplers, air flow calibrators, radioiodine sampling cartridges, collection filter paper, combination filter holders, and complete stack/fume hood sampling systems including the Shrouded Probe designed per ANSI N13.1 1999.

HISTORY COMMITTEE **Booth: 804**

HOPEWELL DESIGNS, INC. **Booth: 320**

Irradiator calibration systems-manual or automated, x-ray inspection systems, lead shielding products, and mechanical positioning systems. We offer complete integration services including electronic design to data analysis and calibration software.

HPS STANDARDS **Booth: 706**

ILLINOIS INSTITUTE OF TECHNOLOGY **Booth: 122**

Illinois Institute of Technology offers an online professional master's degree in Health Physics. This non-thesis program can be completed in two years of part-time study. The 11-course curriculum provides excellent preparation for the American Board of Health Physics Certification Examination. www.bcps.iit.edu/psm

ISOTOPE PRODUCTS LABORATORIES **Booth: 423**

Isotope Products Laboratories is a NIST traceable laboratory supplying radioactive standards, sources and nuclides for counting room use, instrument calibration and environmental monitoring, specializing in custom requirements.

J. L. SHEPHERD & ASSOC. **Booth: 305**

Gamma, beta and neutron instrument calibration and dosimeter irradiation facilities, gamma research irradiators, process irradiators, and blood component irradiators with remote local and computer controls including calibration databases. Source/device decommissioning.

K & S ASSOCIATES **Booth: 109**

K & S Associates provides accredited calibrations for diagnostic, health physics equipment, such as kVp, mAs, and light meters, plus densitometers, dosimeters, multifunction meters, ion chambers, electrometers, triad kits and much more.

LABORATORY IMPEX SYSTEMS LTD. **Booth: 520**

Air monitoring (aerosol, radioiodine, noble gas) network systems (plant, environmental) stack emissions (nuclear and PET applications)

LANDAUER INC. **Booths: 312, 314, 316, 318, 413, 415, 417, 419**

Landauer is the nation's leading provider of personnel radiation dosimetry services. New OSL technology, Luxel® dosimeter, measures x-ray, beta and gamma radiation along with neutron detection capabilities. NVLAP accredited. Landauer offers a full range of reports, ALARA aids, interactive computer systems, dosimetry management PC software and other related services. Aurion operational dosimetry service combines the Internet and cutting edge DIS technology to help control exposure.

LASER INSTITUTE OF AMERICA **Booth: 615**

Laser safety training, certified laser safety officer, laser safety publications and products, ANSI standards

LAURUS SYSTEMS, INC. **Booth: 200**

Sales, service, training - radiation detection instruments and software solutions. Full line of equipment designed to detect and protect personnel and property.

LND, INC. **Booth: 422**

Nuclear Radiation Detectors including, GM Tubes, Proportional Counters, He-3 and BF-3 Neutron Detectors, Ionization Chambers. Worlds leading detector manufacturer.

LUDLUM MEASUREMENTS, INC. **Booths: 400, 402**

Ludlum Measurements, Inc. will display portable and laboratory instrumentation used in the Health Physics industry.

MGP INSTRUMENTS **Booths: 306, 308, 407, 409**

MGP provides a full range of instrumental and engineering services for health physics applications and radiation monitoring systems for all nuclear facilities and civil defense markets.

MILLENNIUM SERVICES, INC. **Booth: 219**

Millennium Services, Inc. provides professional radiological support services including Health Physics program development, implementation, management, and assessment; as well as the design and execution of innovative site closure strategies and radiological surveys through application of MARSSIM and advanced survey technologies.

MJW CORPORATION INC. Booth: 614
MJW is a professional radiological consulting firm specializing in software and services for private industry and government agencies. Collaboration between the multimedia and radiological divisions keeps MJW on the front line of technological progress.

NATIONAL DIAGNOSTICS Booths: 607, 609
For over 25 years, National Diagnostics has been a consistent innovator in the fields of liquid scintillation counting and radiation safety. National Diagnostics is particularly proud of the innovations we have made to improve laboratory safety and reduce the environmental impact of research. With the introduction of Ecoscint in 1985, National Diagnostics developed the first biodegradable scintillation fluid. In 2003, National Diagnostics introduced Ecoscint Flow, which significantly improves performance in HPLC flow counting and greatly reduces waste volume.

NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY (NIST) Booth: 106
The National Institute of Standards and Technology (NIST) provides the national standards (Standard Reference Materials (SRMs)) for over 50 radionuclides useful for the calibration of detectors and other instruments used in radiation detection and measurement. Catalogs will be available describing these and other SRMs, as well as NIST calibration services. Information will also be available describing the NEI/NIST Measurement Assurance Program for the Nuclear Power Industry.

NEWPORT NEWS INDUSTRIAL CORPORATION Booth: 619
NNI manufactures the HotGuard™ line of lead-free radiation shielding products. Standard HotGuard™ products include Blankets, Sheets and Pipe Wrap. Custom design and molding is available for your specific application which can significantly reduce shielding installation time and dose.

NORTH AMERICAN SCIENTIFIC, INC. Booth: 108
North American manufactures a wide range of catalog configurations and customized radioactive standards and sources for a variety of Health Physics requirements. Our annual participation in NIST is the heart of our calibration standards for all your needs. Please stop by to discuss your special needs.

NRRPT Booth: 802

NSSI Booth: 516
Radioactive, hazardous, and mixed waste treatment. Tritium recovery. Treatment of high hazard chemicals, gases, and radioactives.

NUCLEAR ENERGY INSTITUTE Booths: 701, 703, 705
An exhibit detailing the multiple uses of nuclear technologies plus a “contact your representative” computer set up.

NUCLEAR NEWS/ RADWASTE SOLUTIONS Booth: 523
A monthly and bimonthly magazine, published by the ANS, which combined cover the breadth of nuclear science and technology issues as they relate to industry professionals. Advertising is accepted and subscriptions are available.

OAK RIDGE ASSOCIATED UNIVERSITIES Booth: 112
ORAU provides a variety of services in the radiological sciences: Training, environmental surveys, decommissioning, epidemiology and, emergency response.

ON SITE SYSTEMS, INC. Booth: 503
Developers of the SQL client server based Environmental Health & Safety Assistant software program. The EH&S Assistant is a centralized database and safety management system providing summary-level inventory of Radiological, High Consequence Biological Agents and Toxins or Chemicals used or stored within the facility or campus. The client based program features high performance 32bit optimization, email capabilities and security at both the application and the application function level. Better organization allows for the selection of appropriate control measures, allowing for improved regulatory complicance and enhanced safety procedures. Comprehensive complicance documentation is the key, for with it negligence is assumed.

ORDELA INC. Booth: 522
ORDELA, Inc. produces a line of alpha spectronicity instrumentation including the PERALS alpha-liquid scintillation spectrometer Frisch-grid alpha spectrometer and 1000 square cm windowless, ultra-low background gas flow proportional counters.

ORTEC Booths: 218, 220, 319, 321
ORTEC is a global supplier and world leader in the design and manufacture of nuclear detection instrumentation including the latest in mechanical cooling technologies for Germanium gamma-ray detectors. Stop by our booth to see the latest in solutions for Homeland Security including an LN2-free portable detector as well as an array of systems for radiochemistry laboratory applications.

OVERHOFF TECHNOLOGY CORP. Booths: 621, 623
Design and Manufacture of Electronic Instrumentation for Measurement of Radiation.

PACIFIC ECOSOLUTIONS, LLC Booth: 602
Full service one stop shop for all of your radioactive and mixed waste treatment needs. No disposal volume for certain volatile radionuclides and all liquids.

PACIFIC NORTHWEST NATIONAL LABORATORY Booth: 800
Pacific Northwest National Laboratory, operated by Battelle for the US Department of Energy, conducts research in support of, and provides services to, radiation protection and nuclear interdiction programs. PNNL performs conformity assessments for radiation detection instruments including “pagers,” survey instruments, radionuclide identifiers, and radiation portal monitors to ANSI N42.32, N42.33, N42.34, and N42.35. Transfer standard calibrations and dosimeter irradiations using photon, neutron and beta radiological reference fields are provided through PNNL’s ionizing radiation laboratory, accredited through the National Voluntary Laboratory Accreditation Program.

PERMA-FIX ENVIRONMENTAL SERVICES Booth: 114
Perma-Fix Environmental Services provides turnkey hazardous, low level radioactive, and mixed waste treatment services at our fully licensed and permitted facilities. These services offer our customers the most comprehensive hazardous, radioactive and mixed waste treatment services capabilities in the U.S.

PHILOTECHNICS, LTD. Booth: 204
LLRW and Mixed Waste brokerage services, HP services including D&D, license terminations, etc., and industrial hygiene services.

PRINCETON GAMMA TECH **Booth: 604**

HPGe gamma-ray detectors (standard & custom designs) with high resolution spectroscopy electronics and software. NaI detectors with spectroscopy electronics and software featuring patented QCC technology. Full range of stand alone MCA modules.

PROTEAN INSTRUMENT CORPORATION **Booth: 309**

Protean Instrument Corp. is the leading supplier of high performance alpha/beta counting systems, and the only company 100% dedicated to the manufacture of these systems. We manufacture a range of 7 basic models, including automatic, manual, single detector, multi-detector, windowed and windowless. We deliver twice the performance!

PROXTRONICS, INC. **Booth: 505**

Dosimetry Badge Services, Radiation Protection Equipment

PULCIR, INC. **Booth: 404**

Health Physics and medical physics products including safe training systems simulation instruments and isostock radioisotope inventory & making software. Pulcir is also your Southeastern representative for Ludlum and other fine manufacturers of Health Physics instruments.

RADIAC ENVIRONMENTAL SERVICES **Booth: 521**

RADIATION DETECTION COMPANY **Booth: 521**

Radiation Detection Company (RDC) is an NVLAP accredited supplier of dosimetry services. Established in 1949, RDC offers the best price value in the industry while maintaining the highest level of personal customer service. Please visit our booth.

RADIATION SAFETY & CONTROL SERVICES INC. **Booth: 111**

Radiation Safety & Control Services, Inc. provides health physics consulting, decommissioning services, survey instrument calibration and repair, radiation safety training, radiation detection equipment sales, and professional staff augmentation.

RADIATION SAFETY ACADEMY **Booth: 205**

For those who want the best understanding and assurance of radiation safety. We have four Certified Health Physicists with over 75 years of combined experience. We provide training in all aspects of radiation safety from Radiation Awareness, Instruments, Regulations, Transportation, Radiation Safety Officer, to CHP Exam Preparation and others. We offer the best source of online training (www.RadTrainONline.com) and will even design courses specifically to meet your company's needs. Our CHPs can provide consultation for all types of radiation safety needs including; license application and amendments, sealed source and device registrations, on-site audits, radiation safety program development, effective safety communications, and expert witnesses. Partner with the Radiation Safety Academy for success and receive your free radiation safety program review.

RADIATION SAFETY ASSOCIATES **Booth: 506**

Radiation consulting services, radiochemical analysis/lab services, instrument calibration and repair, decontamination and decommissioning, professional publications (journals & reference books) and software and detection equipment for HPs.

RSO, INC. Booth: 303
Celebrating 30 years of Health Physics Products and Services 1974-2004. RSO, Inc thanks the Health Physics Society for being a part of our continued success.

S. E. INTERNATIONAL, INC. Booth: 507
The Radiation Alert® product line offers handheld ionizing radiation detection instruments including Geiger counters, dosimeters, and multi-channel analyzers for surface and air contamination. Proven reliable in environmental, industrial, laboratory research, Health Physics and educational fields.

SAIC/EXPLORANIUM Booth: 420
SAIC provides radiation measurement instrumentation, and chemical and explosives detection systems for Emergency Responders, Law Enforcement, and Health Physics professionals. SAIC Advanced Security Products and SAIC Exploranium will be displaying gamma spectroscopy survey meters, electronic dosimeters, personnel and area radiation monitoring systems, x-ray imaging, and cargo inspection systems.

SAINT-GOBAIN CRYSTALS Booth: 613
Gas-filled radiation detectors; Scintillation crystals, including our exclusive Brillance™ crystals; Cast plastic and liquid scintillators; Plastic scintillating fibers; CdZnTe.

SCIENTECH, INC. Booth: 322
Scientech has more than 31 years of experience providing health physics and decommissioning services to academia, DOE and commercial clients. From simple one laboratory decommissioning to full scale turnkey D&D projects-Scientech does it all.

SCIONIX Booth: 509
Scionix is a company producing equipment and components for radiation detection instruments employing scintillation crystals and materials. Scionix specializes in designing and manufacturing custom made detectors for your application and to your specifications. Our specialties include ruggedized detectors using NaI(Tl), BGO, CsI(Tl) along with detectors that have built in Cockroft Walton power supplies and associated electronics.

SEVERN TRENT LABORATORIES (STL) Booth: 612
Severn Trent Laboratories (STL) is the world's largest and most extensive provider of environmental analytical services. Within its five (5) licensed laboratories, STL offers comprehensive services, including specialty analyses: low level Explosives, low level Perchlorates, Aquatic Toxicity, Air Toxics, and Bioassay.

SPECTRUM TECHNIQUES Booth: 408
Radioisotope check sources, GM counting equipment, scintillation spectrometers.

TECHNICAL ASSOCIATES Booth: 301
Recent additions to TA's Health Physics instrument line include air and area monitors, which are smarter, more sensitive and more rugged than previously available, in addition to pipe and plume and the latest advances in portables.

TELETRIX CORPORATION Booth: 501
Simulated radiation meters for drills and training.

THE OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION Booth: 704
OSHA/HPS Alliance

THERMO ELECTRON CORPORATION **Booths: 502, 504, 603, 605**

Thermo Electron Corporation's diverse line of radiation measurement & protection products covers everything from simple hand-held Geiger counters to complex integrated monitoring systems to custom neutron sheilding configurations.

THOMAS GRAY & ASSOCIATES, INC. **Booth: 323**

Thomas Gray & Associates, Inc., also representing Environmental Management and Controls, Inc., (EMC) and RWM-Utah, Inc., offers a full line of Health Physics services, including LLRW disposal, consolidation, transportation, site remediation, & HP services.

TLG SERVICES, INC. **Booth: 616**

TLG, a unit of Entergy Nuclear, Inc., provides D&D services including cost estimating, testimony, program planning, final surveys and field management. Successful projects include nuclear & fossil-fueled plants, research facilities, & government projects

TSA SYSTEMS **Booth: 508**

Radiation Detection Equipment

U.S. DEPARTMENT OF LABOR-ENERGY EMPLOYEES OCCUPATIONAL ILLNESS COMPENSATION PROGRAM **Booth: 617**

EEOICPA provides compensation to certain DOE current former nuclear weapons workers who have contracted radiogenic cancers, silicosis or beryllium diseases.

U.S. NUCLEAR REGULATORY COMMISSION **Booth: 518**

The mission of the U.S. Nuclear Regulatory Commission is to regulate the civilian use of nuclear power and nuclear materials to protect the health and safety of the public, the environment, and the nation. NRC monitors and protects nuclear power plants.

XRF CORPORATION **Booth: 406**

Hand held gamma ray spectrometers, custom probes, isotope identification software, x-ray fluoresquence spectrometers for field testing of lead and other heavy metals.

CURRENT EVENTS / WORKS-IN-PROGRESS ABSTRACTS

P.62 The Effects of Gamma Irradiation on Arabidopsis thaliana. *T. Pixton, J. Constable, A. Huda; California State University, Fresno*

This study is a work in progress to determine the effects of gamma radiation on Arabidopsis thaliana, the model plant system for plant biologists. The objective is to evaluate plant physiological processes to determine the suitability of this species as in situ dosimeter. This could assist in the determination of radiation exposures in accidents and planned environmental releases. Arabidopsis was selected for its rapid life cycle and well known physiology. Plants will be irradiated with five doses of gamma radiation (50rad, 500rad, 5krad, 15krad, and 40krad) at each of four growth stages: cotyledons fully open, 3 rosette leaves open, 10 rosette leaves open, and appearance of first flower buds. An unirradiated control group will be maintained for each plant growth stage. Static and dynamic examination of physiological processes will be performed to evaluate the radiation effects on plant growth. The static measures at end of the flowering stage will include total biomass, root:shoot ratio, leaf area, average internode length, and height. The dynamic measures will examine rates of respiration and photosynthesis before irradiation and every five days after irradiation.

P.63 Preparing Facilities for Risk-Informed, Performance Based Inspections. *R. Michel, N. Jacob; VA San Diego Healthcare System, Brown University*

Facilities inspected in the past few years may have noticed a significant change in philosophy by regulators. The NRC and many Agreement State agencies have implemented a performance-based, risk informed approach for inspecting Radiation Safety Programs. This new, less prescriptive approach originates from the necessity to produce safety benefit commensurate with their cost to the industry and still maintain health and safety performance. In times of diminishing resources, while compliance with regulatory requirements is important, regulatory agencies have been focusing on those areas that provide the greater safety benefit. The NRC and Agreement States are acting in many fronts to become more efficient, more focused on risk and less burdensome. Performance-based inspections allow regulatory agencies to look for root causes of problems dealing specifically with health and safety issues. This process incorporates more observations and questioning of licensees by the inspector. Unfortunately many facilities are not prepared for inspections under this new approach. The objective of this paper is to provide individuals responsible for overseeing Radiation Safety Programs with simple and practical measures that would assist them in adjusting to this approach and preparing their facilities for inspections.

P.64 Localized Gamma-Ray Spectrometry Measurements of School Sites in Palos Verdes, California. *L.E. Fukumoto, J.S. Duval, J.M. Fukumoto, S.L. Snyder; Palos Verdes High School, U.S. Geological Survey, Reston, VA, Consultant, Rancho Palos Verdes*

Gamma-ray spectrometry measurements yielding potassium, equivalent uranium, and equivalent thorium concentrations were made at school sites in the Palos Verdes Peninsula Unified School District and surrounding areas. The geologic units that underlie most of the peninsula are marine sediments of the Tertiary Monterey Formation, and parts of the formation are known to be rich in trace elements including selenium,

cadmium, zinc, and uranium. Differences were noted in equivalent uranium concentrations from the local subunits of the Monterey Formation, and a significant fraction of the schools located on the uranium-rich subunits exhibited at least one classroom that exceeded the U.S. EPA action level of 4 pCi/L. Since the Monterey Formation outcrops in other populated regions of California, elevated indoor concentrations are likely to be found on uranium-rich subunits in those areas. In central Los Angeles County alone, it is estimated that over 700,000 people may reside on soils which could support high radon levels. In addition, the current data demonstrate that site-localized gamma-ray spectrometry may serve as an efficient tool to rapidly identify school, residential, and commercial sites with the potential to generate excessive indoor radon levels.

P.65 Performance of Electret Ionization Chambers in Magnetic Field. *P. Kotrappa, L.R. Stieff, T.F. Mengers; Rad Elec Inc., National Institute of Standards and Technolgy*

Electret Ionization Chambers (EIC) are widely used for measuring radon and radiation. The radiation measured includes alpha, beta and gamma radiation. The EIC detectors are unique in the sense that there is no electronics or battery or power supply associated with detectors. Because of this unique nature, these can be introduced into magnetic fields without fear of the effect of magnetic fields on the electronics/ instrumentation. As a part of the continuing program on characterization of electret ionization chambers, it was of interest to investigate the effects of magnetic fields in the performance of these detectors. The Magnetic Material Group of NIST (Dr.R.D.Shull) has a suitable wide area magnet whose magnetic field strength can be controlled. The gap is large enough to introduce the detectors. The Magnetic fields chosen were from 100 to 7000 Gauss. The magnetic fields can be turned on and off as needed. The alpha source used was a 250 Bq Th230 source. The beta source used was a 4000 Bq Sr-Y90 source. The gamma radiation from a Co60 source was beamed to the area of magnetic field. That radiation exposure rate was approximately 0.3 mGy/hr. The EIC chosen for the tests was a circular chamber with 8-cm diameter and 3 cm high. Such EICs are used for measuring alpha, beta and gamma radiation. These detectors can be located either broad side on or end on, in the magnetic field. No change in detector response was observed for the varied magnetic field strengths while measuring alpha radiation or gamma radiation. There was a significant change in detector responses at different magnetic field strengths while measuring beta radiation. Relative response decreased to 0.65 in end-on-position and increased to 2.5 in broad-side-on position for a magnetic field of 7000 Gauss. This is explained as due to acceleration of electrons (beta radiation) into circular motion by the magnetic fields. Such moving electrons can spend more time in air (higher response) or less time in air (lower response) depending upon when they meet depositing surface. It is concluded that magnetic fields up-to 9000 Gauss have no effect while measuring alpha and gamma radiation, whereas there was a significant effect while measuring beta radiation.

P.66 Electret Chambers for Measurement of Photon Exposure Levels in a 1.5 to 2.5 Microsecond Pulse Length Linear Accelerator Lab. *P.J. Demopoulos, G. Andrews, P. Kotrappa; ATL international inc., Yale University, Rad Elec Inc.*

Electret Ion Chambers (EICs) are commercially available, passive integrating devices used for monitoring indoor air and water radon concentrations and environmental gamma radiation. An electret contains a Teflon disk that is electrostatically positively charged and mounted in an electrically conducting plastic chamber. When ionizing radiation penetrates the chamber and deposits charge in the chamber's electrostatic field, the disk is proportionaltely discharged. A portable reader is used to measure the voltage drop. The difference is compared to a calibration factor for the particular sized chamber used to determine the total exposure. Dividing by the time of exposure an exposure rate can then be determined. Several linear accelerator configurations were monitored for gamma radiation field levels. The MIFELA (Microwave Inverse Free Electron Linear Accelerator) is a 6 - 8 MeV accelerator with a 2.5 microsecond pulse width, a 1 pulse per second pulse repetition frequency and a 0.05 amp instantaneous current. The Magnecon is a 0.5 MeV linear accelerator with a 1.5 micorsecond pulse width, a 2 pulse per second pulse repetition frequency and a 200 amp instantaneous current. Surveys were taken at different locations inside the exclusion area of the accelerators and in locations in the unrestircted areas. H chambers for low exposures and L chambers for high exposures were used. The exposure data could be immediately assessed which enabled the experiments to proceed without much interuption. Qualitatively, a portable pressurized ion chamber used in the integrate mode, an area pressurized ion chamber, electronic CdTe integrating personnel dosimeters and TLD badges were all utilized. The electrets proved to be a versatile tool for gamma monitoring in the accelerator exclusion areas as well as in the unrestricted areas.

P.67 Simplified Method for Environmental Dose Reconstruction for the Savanah River DOE site. *N.A. Eisenberg, B. Rautzen, P.J. Demopoulos; ATL*

The Radiation Studies Branch, Centers for Disease Control (CDC), and Advanced Technologies and Laboratories International, Inc. (ATL), are conducting a dose reconstruction study of the Savannah River Site. The ultimate objective of this study is to determine whether the historic releases of radioactive and hazardous materials from the Savannah River Site have caused or may cause health effects in the SRS offsite populations. An established paradigm for conducting such dose reconstructions proceeds in five phases. Phases I and II have been completed; Phase III is currently underway. However, because of reduced funding levels and the need to resolve the publics' concerns in a timely fashion, innovative approaches have been advanced for moving further in the current phase of the study. There are formidable technical barriers to obtaining supportable analyses quickly and easily. Some examples of the strategies for providing additional insights with less effort and time include:

1 The use of hypothetical scenarios to represent realistic, but bounding examples of life style characteristics important to contaminant exposure;

2 Simplification of an extremely complex source term by use of a few virtual sources to represent combinations of geographically distributed individual sources;

3 Use of average meteorology over several decades to represent air dispersion conditions for the 39-year period of study

4 Modeling a reduced set of radionuclides based on a conservative, screening calculation;

5 Reduction in the number of exposure locations, by combining nearby activities into a single location.

CDC and ATL are using an Advisory Committee and other means to review these strategies and to obtain stakeholder input.

P.68 Instruction of Undergraduate Students in Monte Carlo Simulation. *P.C. Fulmer, D.M. Peterson; Francis Marion University, Dade Moeller and Associates*

Francis Marion University has maintained a health physics undergraduate program for two decades and seeks to ensure that graduates are prepared for graduate school or the job marketplace. During the Spring Semester 2004, instruction in Monte Carlo techniques as applied to radiation transport was provided to students. Students were shown the various thought and logical processes that must be followed, and students were required to complete a design project in which they wrote a computer program that projected photon fluence through several absorbers based on multiple interaction mechanisms. Because of the need of current-day graduates to be skilled in office presentation software, the students were further restricted in performing the Monte Carlo simulation using Microsoft Excel (trademark of Microsoft Corporation) with the Visual Basic tools included. This presentation will discuss the approach used in the instruction and the various options that were considered, especially programming language and the analysis of results. Also, lessons learned will be presented, along with ideas for how this instruction will be performed in future semesters with particular emphasis on design of projects that can be experimentally verified.

P.69 Initial Testing and Evaluation of the Canberra iSolo System. *R.A. Kellner; Westinghouse Savannah River Company*

This poster will present the initial results of testing performed on the Canberra iSolo to evaluate the instruments ability to accurately detect and report a known amount of radioactive material contained in a sample.

Testing included analyzing a variety of alpha and beta emitting sources and samples (Am-241, Pu-239, Np-237, Cs-137, Sr/Y-90, and Cl-36), several different sample media types, and analysis before and after 'loading' the sample with radon background.

The iSolo is new packaging of a PIPS detector that has been optimized for alpha and beta analysis. The system uses a PIPS detector, MCA, and software to compensate for Radon interference on air sample filters, or any sample media for that matter. In theory, it should allow filter paper air samples to be analyzed immediately after they are stopped and provide a rapid indication of any airborne alpha or beta radioactivity of concern. In the presence of variable or elevated Radon in the air being monitored, the ability to rapidly identify 'real' or 'background' is very important, particularly if the operating facility has processes involving alpha emitting radionuclides.

The instrument is being evaluated to augment the overall air-monitoring program. This is a work in progress in that I will not be drawing any conclusions, merely providing a summary of the observed response characteristics to a variety of well-characterized radioactive sources, and several radioactive air filters. A complete field evaluation and testing of the instrument will be completed at a later time.

P.70 Comparison of Different Pulse Shape Discrimination Methods for Phoswich and CsI:Tl Detectors. *P. Chandrikamohan, T.A. DeVol; Clemson University*

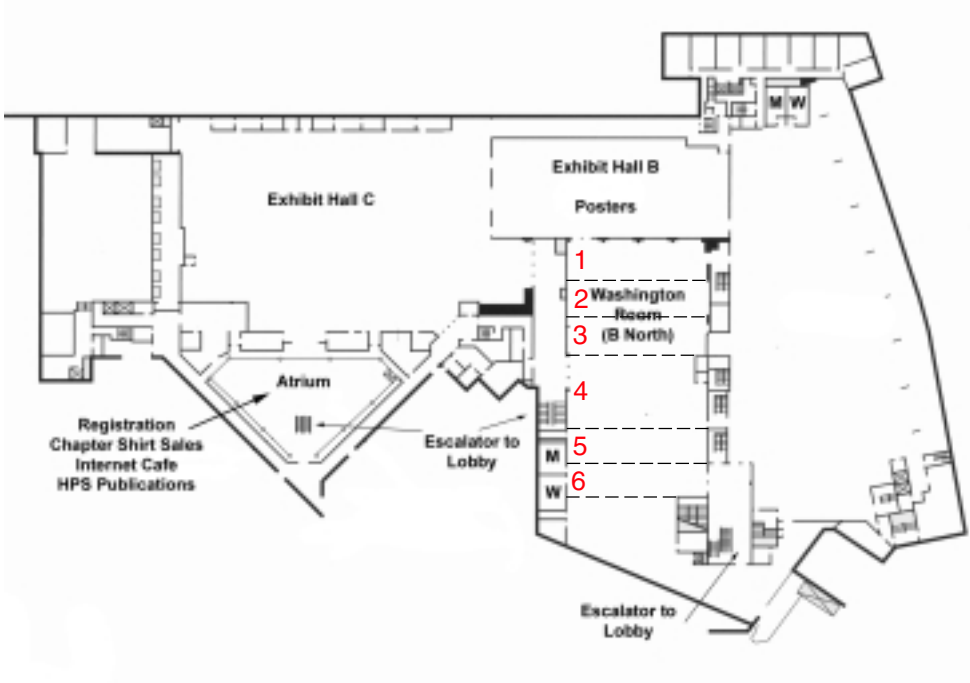
Comparison of different pulse shape discrimination methods was performed under two different experimental conditions and the best method was identified. Beta/gamma discrimination of 137Cs (Egamma= 0.662 MeV) and 90Sr/90Y (Ebetamax= 2.284 MeV) was performed using a phoswich detector made of BGO (2.5 x 2.5 cm) and BC400 (2.5 x 1.2 cm) scintillators. Alpha/gamma discrimination of 210Po (Ealpha= 5.304 MeV) and 137Cs (Egamma= 0.662 MeV) was performed using CsI:Tl scintillator. The four pulse shape discrimination methods used for the comparison were charge comparison, rise time discrimination, digital constant fraction discrimination and normalized analog-to-digital conversion (ADC) value discrimination methods. The normalized ADC value method is the ratio of the pulse height at a particular time after the beginning of the pulse to the maximum pulse height. The charge comparison method resulted in a Figure of Merit (FoM) of 3.40 and 3.91 for the phoswich setup and the CsI:Tl scintillator, respectively. The normalized ADC value discrimination method resulted in a FoM of 4.26 and 3.35, respectively. Another method, known as the inverse method - using the inverse of the pulse shape parameter, typically resulted in a significantly higher FoM than methods using the pulse shape parameter directly, but there was no reduction in % spillover values. This outcome illustrates that the FoM may not be a good scheme for the quantification of a system to perform pulse shape discrimination.

P.71 New Methods for Sorting Bulk Material at High Rates. *J.J. Shonka, M.R. Marcial, J.L. Kelley, D.M. Debord, J.M. O'Brien, K. L. Murray; Shonka Research Associates, Inc.*

Sites undergoing D&D have bulk material that must be properly assayed to allow use of the lowest cost disposal option. A new method for monitoring material at high throughput has been developed that can work with any material handling equipment. This method employs specialized radiation monitoring instrumentation at major steps in the overall process as to attain high overall throughput: 1) a dig face characterization instrument, 2) flexible scanning instruments hardened to permit subsurface placement, and 3) a modular Noise Adjusted Single Value Decomposition (NASVD) gamma spectrometer system for monitoring and sorting process streams from devices such as conveyors. This complement of instrumentation is interconnected using a wireless network. The high throughput afforded by the system offers significant cost savings over conventional approaches through schedule compression and reduced disposal costs via smaller assay volumes. The system has been deployed at a 4 hectare site sorting 300 tons per hour, while using sort sizes as little as 100 kilograms.

Health Physics Society 2004 Author Index

Exhibition Level Floor Plan
Marriott Wardman Park Hotel



Lobby Level Floor Plan
Marriott Wardman Park Hotel